



## DAVE PEARMAN

### The new macro and script viruses are spreading on the Internet like wildfire... and it's all your fault, says Dave Pearman

**U**ntil a few weeks ago, the Internet was seen by many as the future. It was going to connect the world in a huge network of computers, hand-held devices and televisions, enabling billions of people around the globe to work and play together in harmony (cue soothing background music – click [HERE](#) if it doesn't start automatically).

But now there's trouble in paradise. The Internet can also spread viruses, as millions of people found out when they opened a harmless-looking message confessing undying love. The industry and media went into serious panic mode, as site after site was brought to its knees under the deluge of self-replicating e-mail messages. It was revealed that the House of Commons e-mail system had been brought down by the 'I Love You' virus, and for a while it looked as if the entire fabric of our Brave New World of communications was being torn apart.

Well, we're still here – and so is almost everyone else, including the House of Commons – and we're still talking to each other by e-mail. This wasn't a concerted and vicious attack by enemies of the Western World, either. It all started with a moderately skilled PC user in the Philippines, allegedly hacked off with an Internet Service Provider.

### Why were millions of people taken in by such a dangerous program? Ignorance and incompetence, mainly

The virus wasn't a cunning executable, designed to penetrate a heavily-defended system by stealth, before nibbling away at sensitive data slowly enough to defeat the users' backup procedures.

No, it was the modern equivalent of a batch file, quite probably written in Notepad. When it was run, it sent itself to everyone in your Outlook address book, then deleted or renamed the files on your hard disk. How amusing. Not. But why were millions of people (or tens of millions, or hundreds of millions, depending on which paper you read) taken in by such a dangerous program? Ignorance and incompetence, mainly.

Despite Happy99 and other viruses sent as programs attached to e-mails, many people still don't realise that opening attachments of unknown origin is A Bad Thing. And even if they did, this seemed to come from someone they did know, though why your boss should be telling you that he loves you in an e-mail isn't clear.

Next, the virus 'code' was in VBScript, which is run by the Windows Scripting Host, a part of many Windows 98/2000 and IES

installations. Responding to the request to "Kindly check the attached LOVELETTER coming from me" users opened the attachment, LOVE-LETTER-FOR-YOU.txt.vbs. This looked harmless enough, and the icon was suitably non-threatening. If people were slightly suspicious, or sensible, they saved the attachment to their hard drive first. This only made things worse, as by default Windows doesn't display the file extensions of registered file types. The file now seemed to be called LOVE-LETTER-FOR-YOU.txt, and as everyone knows, text files can't contain viruses... If they were still thinking of safe computing at this point, they ran their virus checker, which probably didn't recognise .vbs files as executable, and almost certainly didn't recognise the virus anyway, as it was too new. The rest is history.

As you can see, users' ignorance of the dangers, while regrettable in retrospect, was perfectly understandable. What isn't so understandable or defensible is the way this industry has allowed operating systems and applications which are wide open to even moderate tampering to become not only dominant, but trusted. Outlook clearly has security holes you could drive a US Courtroom through, a fact demonstrated by the hasty promises made by Microsoft as soon as this problem became clear. The solution, it seems, will involve removing the features that could cause viruses to spread, and are so major that at the time of writing the project is already over a week late.

Once again, hindsight is always 20-20, but the industry-standard method of releasing software is to blame. While lots of testing is done to make sure that the 500 new features actually do something (even if it's pointless), there seems to be little thought about what can go wrong. After all, there's always a Service Release coming along. Or another new version. And it's all because you (yes, YOU at the back there) have always coughed up for each new release as it came out, that software marketing is all about numbers, not fitness for purpose. These days, you don't even wait for the box to turn up in PC World, as you can download it five minutes after the Beta is considered stable enough (remember, this means that enough of the new features work) for the public release.

If you think the I Love You outbreak was bad, consider this – it could have been 100 times worse, and probably will be. Consider that when you think about buying the first of the '2001' applications, which will surely turn up any day now. Linux users must be laughing themselves silly. **PCP**

**Is the convenience provided by integral OSes and apps worth the trouble?**

**Write and let us know to  
pcplus.mailbox.co.uk  
or to Dave at  
dave.pearman@futurenet.co.uk**





## MARTIN BANKS

**I was going to pass up the opportunity to comment on the potential break-up of Microsoft, honest I was, but recent developments have made me reconsider**

**R**ecent evidence for this change of mind comes in the form of two things – the launch by Microsoft of the Pocket PC. This is intended to make Windows CE into a really usable system for the soon-to-be-huge Personal Digital Assistant marketplace. A number of hardware manufacturers, such as Compaq, Casio and Hewlett-Packard, have rushed out of the traps with devices using the new environment, and the early word on the street seems to be far more favourable about it than they ever have been about Windows CE (which soon gained the unflattering acronym of 'WINCE').

Okay, so the arrival of a new operating environment for personal, pocketable posing (PPP) machines may seem to be hardly the stuff of which major quasi-political decisions, such as should the Big M go for break-up or fight it, are made. But ask yourself one question: such machines have been around for a good while and what is the key element of those that have been successful? Yes, they have diaries and WP tools and databases and calculators. But the real benefit comes when something that small can communicate with other systems.

That is why devices such as the Palm and the Psion have become popular with business users. Unless you need to carry the company database around with you, or are partial to delivering death by Powerpoint presentations, these machines are perfectly adequate for the key job of 'keeping in touch'.

The second development is the recent auction for mobile phone licences. This has started the ball rolling on what will be the real, long term development path of PPP devices – connection to a cellular, wireless communications system with sufficient bandwidth to cope with every user's demands. This is going to be a market that makes the PC business as we have known it for the last 15 years or so pall into insignificance. That is why the service providers have been so willing to stump up such gargantuan amounts of money to get a slice of the pie.

It is, of course, a long way off yet, but improvements in bandwidth for mobile phones are coming already. I have to say I think the TV adverts put out by BT about 'surfing the Web' on a mobile phone are, shall we say, more than a little economical with the truth. The company would no doubt say it is 'promoting the future' or some such marketing tosh, but it sure as hell is giving the wrong impression about the here and now. Yes, you can surf the Web via a mobile phone, but it ain't fast and it is limited and expensive.

The future of all this is, however, markedly different, as the mainstream media has pointed out incessantly of late. And while WAP-based phones are likely to be major players here that bit of the future is by no means clear-cut. There are the inevitable legal battles between companies starting to appear, usually about which owns the licences to sell what. A recent set of tests run on 50 WAP-compatible Web sites – from start ups to multinational corporations – found that over a quarter of them contained serious errors in their operation.

Part of the problem is that it is still early days with the interpretation of 'standards', and with 27 different WAP phones available – and a handful or two of WAP gateways – incompatibilities are the order of the day. There are, indeed, those that say WAP may not even make it as the

dominant standard for the new generation of phones.

Whether that turns out to be the case or not, Microsoft has a finger in both alternative pies, and is getting ready to pull out a plumb from either. The new generation of phones, and certainly the ones that come after, are going to need a far richer set of human interface tools than now exist, and while PocketPC goes a good deal further along the road than WinCE, it is not difficult to predict that it does not go far enough yet... none of the contenders do.

Ironically, this could play into Microsoft's hands, for a significant potential now exists for serious delays in the introduction of the new

**If development is slowed down, it will allow the Microsoft marketing machine to demonstrate that the 'Redmond-way' is the best... and ultimately the 'only' way**

technologies the phone companies have bid to provide. They have spent far more than anyone predicted to get a slice of the action, so much so that there now has to be doubts about their ability to either invest in the R&D to make it happen, or buy in the advanced technology that will be needed.

The only way that will happen is if they charge a heavy premium for anyone using the service – in other words, the business users. Indeed, the cost may even be defrayed on to users of existing services. That, in turn will push development efforts towards business applications and a slowing of the whole development process. As PocketPC comes with cut-down versions of Microsoft Office applications, it is not difficult to see this being the favourite option, if only to save on development time for the business market.

And if development is slowed down, it will allow the Microsoft marketing machine to demonstrate that the 'Redmond-way' is the best... and ultimately the 'only' way. What is more this will be in a market where the revenue potential for the winners will be huge – the first 'Trillion-Dollar-Business' accolade is a highly likely result.

In such circumstances, it will be inevitable that the US Department of Justice will take a microscopic eye to a Microsoft and any movements it makes in this new market. But a separated, diversified business would have the scope to act with far greater freedom, and reap much bigger rewards as a consequence. **PCP**

**What do you think? Are you excited by the next generation of Pocket PCs? Write to us at [pcplus.mailbox.co.uk](mailto:pcplus.mailbox.co.uk) or to Martin at [banksie@cix.compulink.co.uk](mailto:banksie@cix.compulink.co.uk)**





## C H R I S   B I D M E A D

### Chris faces the possible future of e-mail viruses in a world where we use an operating system that lets anyone walk in and make themselves at home

I must admit that I'm getting a little fed up of hearing about the I Love You so-called 'virus' and its various mutations, but the event has had its memorable moments. I was particularly amused by the FBI patting itself on the back for so swiftly tracking down the alleged culprits to Manila in the Philippines. The comment in the code attributing authorship to '@GRAMMERSoft Group/Manila, Philippines' must have been a useful clue. You can't blame the FBI – the Philippines is a nice place to be at this time of year. But if I were in pursuit of the real wrongdoers I'd have headed North To Redmond.

Much of the press coverage has been the usual mumbo-jumbo, but this time around a pleasing number of commentators have seen through the 'hunt-the-hacker' smokescreen and homed in on the real point – the culpability of an operating system that is about as Internet-secure as a tent pitched on the hard shoulder of the M4. On one of my UNIX-based machines here the script opened harmlessly as just another text file, which is why I was able to roar with laughter at the astonishing presumption of code that walks right into your Windows Register, takes over your e-mail address list to replicate itself to all your correspondents, roams round your system deleting files at will, and then starts downloading an executable from a remote Internet site. The cream of the joke is that this isn't the diabolical ingenuity of some fiendish Bulgarian machine-code contortionist. It's a couple of hundred lines of Visual Basic knocked up by a script-kiddie. But I appreciate that if it's your system that's being pillaged like this, you're less likely to see the funny side.

Non-combatants found further amusement in Microsoft's various responses. Would Windows users be naive enough to buy the idea that the DoJ's proposed break-up of Microsoft was somehow going to make for a more LoveBug-prone world? Bill Gates thought so. In *Time Magazine* he floated the suggestion that under the DoJ plan, technology updates to protect against attacks like the LoveBug virus 'would be much harder for computer users to obtain.' According to Gates it's Microsoft's internal secrecy that makes Windows such a, er, safe computing environment. The DoJ proposes that technical information exchange between operating system and applications companies splintered off from Microsoft would only be allowed if the same information is simultaneously published to the entire computer industry. Can't do, says Gates. Such simultaneous publication 'would be a practical impossibility'.

Impossibility, Bill? It's called the World Wide Web. I'd always suspected that you'd missed the point of the Internet, despite the overnight turnaround you put Microsoft through towards the end of 1995 when you belatedly twigged that the Internet was going to be bigger than Microsoft. You immediately embarked on an 'embrace and contract' exercise that attempted to squeeze the whole of that great big Internet into the frail receptacle of Windows.

Actually, Bill, the architecture of the operating system has less to do with LoveBug vulnerability than the business model the DoJ wants to break up. That internal secrecy you're touting doesn't speed up bug fixes at all, as Windows users well know. In the free software world a disastrous security hole – and there have certainly been a few – gets fixed literally within hours of discovery. At the time I'm writing this, over two weeks

after the LoveBug tornadoed through Windows systems across the World, creating tens of billions of dollars worth of damage – guess what. Your 'Round the Clock Security Response Center' is still only promising that 'the Outlook 2000 E-mail Security Update will be available shortly.'

The nuance of the wording on that Web site at [www.officeupdate.microsoft.com/2000/downloadDetails/Out2ksec.htm](http://www.officeupdate.microsoft.com/2000/downloadDetails/Out2ksec.htm) is worth inspection. And not just because of the old, old Microsoft habit of discussing future products in the present tense. "This update limits certain functionality in Outlook to provide a higher level of security," pronounces the page, "it was not created to address a security vulnerability within Outlook."

So there's no admission that there is a security vulnerability in the Microsoft software. Instead Microsoft would like us to focus on the 'malicious hackers' who 'abuse the functionality'. The promised fix to Outlook effectively says: Look, you can have functionality or you can have security, but because of all those bad guys out there, you can't have both.

The functionality in question is the ability of different applications to pull each others strings – and the strings of the operating system – automatically behind the scenes. The problem here is that the string-pulling takes place within the dark bowels of the operating system where there are no facilities for policing what's happening. This is another side to the policy of internal secrecy. Unlike Java, which from its original design concept paid serious attention to security, the ragbag of Visual Basic, ActiveX and COM has the unrestrained run of the show. The only way of securing this mess without decommissioning it altogether is to add yet more layers of mess in the shape of virus filters, and keep your fingers crossed that they're updated often enough.

The I Love You bug was dangerous, but a lot less dangerous than it might have been. Instead of emanating from an original single e-mail source, a future attack could initially be distributed silently across the Internet to myriad innocent intermediary 'zombies', in much the same way as the 'Distributed Denial of Service' onslaught that brought down eBay, Yahoo! and others in February of this year.

The proliferating e-mails won't need to stick themselves with a single, easily filterable Subject header – in fact the new noxious macro could attach itself to stored copies of legitimate e-mails and resend them. And when activated on a new machine it won't risk drawing attention to itself by deleting files. Instead it will get on with downloading its payload from not a single, easily blockable site, but from multiple sites across the world. Put together by a seriously malicious coder, this new blight might remain undetected until the secrets of every Microsoft user in the world had been filched. **PCP**

**How confident are you that your PC could withstand virus attacks? Write and let us know at [pcplus.mailbox.co.uk](mailto:pcplus.mailbox.co.uk) or to Chris at [bidmead@cix.co.uk](mailto:bidmead@cix.co.uk).**





# Unlock Windows secrets!

Whether you're fixing Windows when it's gone wrong or finding ways to use its hidden power better, there's more to it than meets the eye...

**L**et's assume you bought your PC at Christmas. Noticed any strange occurrences yet? Unexplained freezes, increased crashes, problems that have only recently started to manifest themselves?

You're not alone. Welcome to Windows' most unpleasant undocumented secret – its propensity to go belly up after several months of intensive use. Why this happens is down to its legacy of having been cobbled out of various bits and pieces Microsoft had lying around as the company has developed it. The more you use it, the more Windows struggles to keep up with the mass of temporary files, registry entries and improperly uninstalled applications. Eventually the resulting furball of undigested code is guaranteed to give your PC a coughing fit when you least want it.

So what can you do about it? Preventative maintenance is one thing. And the best way to achieve this is simply to reinstall Windows. Do that and most of your problems should disappear.

Unfortunately reinstalling Windows is not the hazard-free undertaking it should be. We show you how to reduce the risks of losing data, overleaf.

If reinstalling isn't the immediate solution, then it's time to start troubleshooting. Ian Sharpe reveals the top ten most common problems and how to solve them.

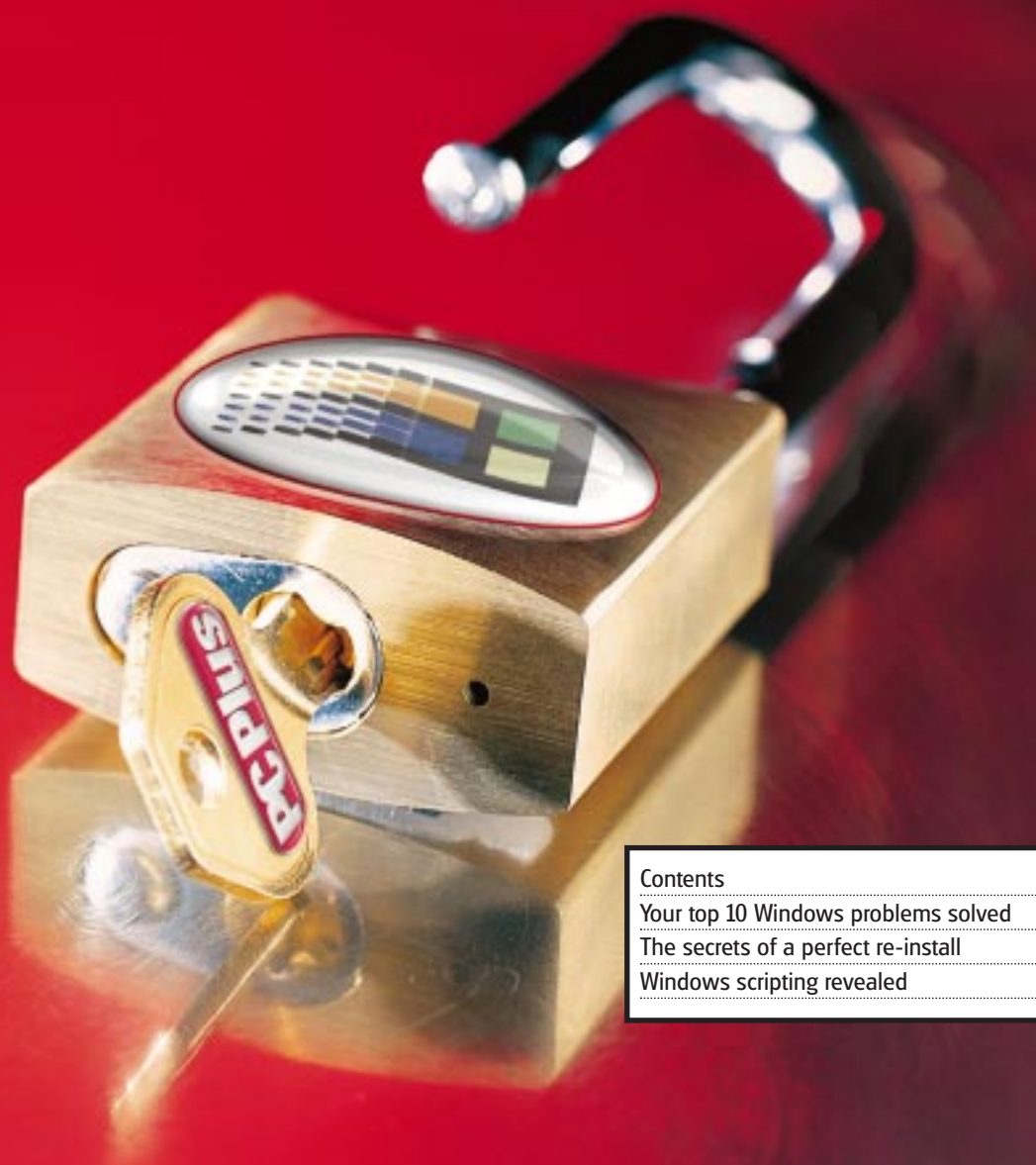
Once you've got Windows running smoothly again, you can really explore some of its lesser-known abilities. One of the most interesting, yet least-used, is Windows scripting. Scripting enables you to automate all kinds of tedious housekeeping that otherwise takes ages. Best of all, although writing scripts used to require a bit extra in the effort department, these days it's been made easy by the sheer quantity of free code snippets thoughtfully provided by other less lazy users, on the Web. We show you the best places to go and the most useful scripts to install.

Turn over and let's get started.



# Unlock Windows secrets!

Peel back Windows' skin and you'll find all kinds of cobbled together code, features and hidden bits and pieces. This is bad and good – bad because Windows' haphazard construction makes it prone to crashes and freezes, good because it means there's lots of handy stuff lurking there which we can use to our advantage. *PC Plus* experts **Ian Sharpe** and **Paul Warner** reveal all.



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# The secrets of... solving Windows problems



Use our selection of hidden resources and secret solutions to solve your most threatening Windows problems

**O**f the many evils that can afflict Windows, a few come up time and time again.

Study this rogues gallery of serial offenders and you're in with a fighting chance of keeping Windows on the rails. Where a problem can happen for a variety of reasons, we present solutions that work most often and direct you to further resources.

## 1 Windows won't start

A definitive list of all the things known to make Windows wake up dead could fill a book, but this emergency guide should effect a cure or help pinpoint the problem.

If start-up fails to reach the splash screen, and perhaps there are complaints about the hard disk, see if you can reboot from your emergency boot-up floppy. If you can't, suspect a hardware or a CMOS problem. The CMOS is where the BIOS remembers settings such as the configuration of disk drives. A series of beeps soon after switch-on is a sure sign of hardware failure, but not necessarily a disk or controller problem.

Check cable connections inside the case, and see that chips and expansion cards are properly seated. If possible, check the BIOS set-up screen to make sure the disk settings are in order. There is usually an auto-detect feature for hard disk parameters. Call in professional help if you don't feel confident.

If the PC boots from floppy, try to log on to drive C by typing 'C:' without quotes and pressing [Enter] afterwards. Failure here indicates a faulty disk or controller, or damage to crucial data on the disk responsible for recording the partition structure and loading the operating system.

Try typing 'FDISK /MBR', again without quotes and followed by [Enter]. An error message strongly indicates a hardware/CMOS fault. Otherwise, try booting from the hard disk again. If the machine still refuses, start from the floppy and try 'C:'. If it

works now, type 'A:\SYS C:' and try to reboot once more.

Still won't load? If you can get on to the C: drive after booting from floppy, type 'DIR' and [Enter]. Missing files and scrambled names indicate the disk's contents are badly corrupted. ScanDisk may not be up to such a major repair job and could make matters worse.

If the only copy of important data is trapped on the drive, try a data recovery specialist – see the box *Help – my disk's dead!* Whether or not you recover data with the aid of special software or a service, if the disk's contents are seriously corrupted you must now format the disk and install everything from scratch. Check the original disk and the new installation for a virus – that's one possible cause of such problems.

If Windows begins to load normally, but dies or restarts around the time the graphical user interface is (or should be) presented, a driver file may be corrupt, or the hardware it drives is faulty, or a key Windows file is broken, or something is conflicting with something else.

Try to reboot in Safe Mode by jabbing [F5] straight after the power-on self test (POST), as Windows is about to load. If Safe Mode works, the core of Windows is okay. Go into Device Manager – press the Windows logo key and [Break] together, then click on the Device Manager tab.

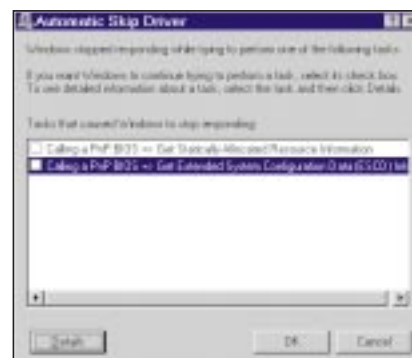
Open the branches and search for indications of trouble, particularly a yellow blob containing an exclamation mark. If an item is shown as having a problem, try disabling it and restarting in normal

mode. You may find Microsoft Knowledge Base article Q125174 useful – it explains Device Manager error codes. Instructions on retrieving Knowledge Base articles mentioned in this feature are in the box *Microsoft's hidden Windows help*.

If you can't see anything, or that doesn't work, boot again and this time tap [F8] or hang on to [Ctrl]. A menu will be presented, from where you can choose a logged start.

After Windows has failed to load, return to the boot menu. Select Command Prompt Only and, when the prompt appears, type: 'EDIT \BOOTLOG.TXT'. You will see a progress report on the failed start. It is normal for some entries to be marked as failures.

**The Automatic Skip Driver agent is supposed to identify drivers which stopped Windows loading, but on this unbootable machine the information was not very useful.**



At the bottom of **BOOTLOG.TXT** we found that the drivers loaded immediately before death control the on-board sound chip. Disabling it in the BIOS set-up enabled Windows start.





## EMERGENCY HELP

## Oh no – my disk's dead!

*Where do you turn when your drive dies and you don't have a backup?*

**Y**ou need to consider a data recovery service. Plenty advertise on the Web, but try these for starters:

**Ontrack** ([www.ontrack.com/uk](http://www.ontrack.com/uk)) 01372 741999

**Vogon** ([www.vogon-international.com](http://www.vogon-international.com)) 0800 581263

**Convar** ([www.convar.com](http://www.convar.com)) 0800 1698552

Expect to pay more than you would save in a whole lifetime's scrimping on a basic backup routine!

Cheap alternatives which may work in less extreme cases are

**PowerQuest's Lost & Found** ([www.powerquest.com](http://www.powerquest.com))

**Ontrack's EasyRecovery** ([www.ontrack.com](http://www.ontrack.com))

Trial versions of both products are available for download.

Go to the bottom and see which files were loaded last. Even if success is indicated, these may be the trouble and you should try to identify what they do. Knock them out somehow – by temporarily renaming them, or by disabling the hardware in question. [Alt][F] then [X] quits from Edit. A further thing you can do is to start in Safe Mode and run Asd.exe – the Automatic Skip Driver agent. This is supposed to identify drivers which prevented Windows from loading.

If Windows seems to load most of the way, and fails just before handing over control, suspect a program loaded automatically on start-up. Try holding down [Shift] during boot-up – this prevents these programs loading. If that does the trick, investigate further using the System Configuration Utility (Msconfig.exe) which enables you to disable files individually.

The next thing to try is rebooting to the command line, and typing 'SCANREG /FIX'. This checks for and possibly fixes registry problems. You can also try 'SCANREG /RESTORE' to revert to an earlier version of the registry, in case the current one is faulty.

As a last resort before reinstalling Windows, see if you can get on-line and read Knowledge Base article Q188867, a guide to troubleshooting start-up problems. Also try the troubleshooting wizard mentioned in the next section.

## 2 Windows won't stop

...Or it may stop, but it doesn't shutdown properly. Either it sticks part way through or crashes and reboots.

There is a sizable list of possible causes, including a bad device driver, hardware problems and a corrupted shut-down sound file. Microsoft had to issue an update to cure a spate of shutdown problems with Windows 98 Second Edition. Even the update had to be updated. It's available from [www.microsoft.com/Windows98/downloads/contents/WURecommended/S\\_WUFeatured/Win98SE/Default.asp](http://www.microsoft.com/Windows98/downloads/contents/WURecommended/S_WUFeatured/Win98SE/Default.asp).

Unfortunately, it doesn't always work. A series of guides to shutdown problems is available in the Microsoft Knowledge Base: Q196008; Q202633

for Win98 or Q238096 for Win98 SE; Q239887 for SE only; Q187607; Q181966; Q231666; Q193677. There is also the start-up and shutdown troubleshooting wizard at: <http://support.microsoft.com/support/tshoot/w98startup.asp>.

## 3 Defrag misdemeanours

Top Defrag headaches are that it gets stuck at ten per cent complete, or it endlessly restarts.

Defrag initially scans the disk for errors and this accounts for the first four per cent of the progress. Between five and nine per cent, Defrag devises a plan of action. Neither process should take too long.

From ten per cent onwards, Defrag moves data. This is slow, but the gauge should creep up gradually. Defrag can die in action, but it can appear to freeze if it seriously underestimates how

## The Knowledge Base is Microsoft's best-kept secret by far and is well worth becoming acquainted with

long part of the disk will take to complete. Try leaving it overnight.

Continual restarting is normally due to another piece of software cutting in and changing something on the disk. Because Defrag's plan might now be inappropriate and lead to damage, it starts over.

Tracing the culprit may be difficult because too many background programs are quietly ticking away. If disabling your screen saver and any scheduling programs doesn't work, just reboot to Safe Mode and run Defrag from there.

## 4 DLL hell

This is the popular name for when you install a program and the computer starts crashing, or some other piece of software or hardware no longer works.

It usually happens when the new program replaces shared files (often, but not always, DLLs –

Dynamic Link Libraries) with its own versions. The replacements could well be incompatible with the other software, for example by being outdated. Luckily there are things you can do about it.

Windows 98 has a defence mechanism. Before you install new software, go to Start / Run and type SFC. Press [Enter] and System File Checker will open.

Start it off, and as it scans your disk it will build a database of important files as well as checking them for corruption.

After installing a program, if you experience trouble, run the System File Checker again. In the settings dialog, ensure that 'Check for changed files' is turned on so that SFC compares files with the records in its database. Changes are reported, giving a shortlist of prime suspects. Note that the

## USING THE KNOWLEDGE BASE

## Microsoft's hidden Windows help

*Microsoft's Knowledge Base has answers to thousands of problems. Here's how to find them*

**T**o read any of the 'Q' – or Knowledge Base – articles mentioned in this feature, type <http://support.microsoft.com/support/kb/articles/> into your browser, then construct the rest of the address from the reference code. For example, article Q239887 is at: <http://support.microsoft.com/support/kb/articles/Q239/8/87.ASP> – reference Qxxxxzz becomes Qxxx/y/zz.ASP in the address.

If you want to pose a brand new question, go to [www.microsoft.com](http://www.microsoft.com) and use the Search feature on the site's menu bar. Type in keywords relating to your problem, and a list of documents will be returned.

The Knowledge Base is Microsoft's best-kept secret by far and is well worth becoming acquainted with.

list of searched locations includes the Program Files folder, but not sub-folders.

You can change this, though files are less often overwritten in a program's home folder. Shared files in the Windows folders are normally the source of the trouble.

A word of caution about SFC: the one with Win98 SE is supposed to be fixed, but the original Win98 version occasionally zaps Windows when restoring a system file – see the February 2000 Help Screen, or Knowledge Base article Q192832.

It's also prudent to save a copy of your registry before installing software. Go to Start / Run and type 'Scanreg /backup'. In case of subsequent registry trouble, reboot to a DOS command line and execute 'SCANREG /RESTORE'.

If you're already caught in DLL hell, try refreshing your Windows installation by reinstalling it over the top of itself (you shouldn't lose program settings) and then reinstall any





## THE SFC REVEALED

## Repairing damage with the System File Checker

SFC has two tricks to keep you out of DLL hell...



**1** Before installing software, get System File Checker to scan your disk. This allows it to record a list of system files and check they are in order.



**2** If you later run into trouble, use SFC again after clicking the Settings button and turning on 'Check for changed files'.



**3** You will be alerted to any files recorded in the first scan that are now different and possibly causing other programs to fail.



**4** SFC can also extract files from CABs. This saves grappling with Expand, but can cause problems in the first version of Win98.

programs that still don't work.

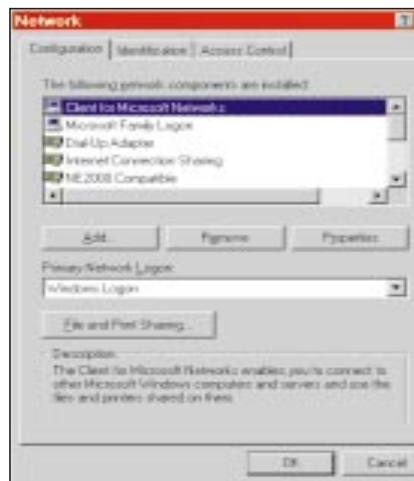
If you can identify the problem file, you can program its own version by placing it in the application's home folder.

### 5 DUN password not remembered

Not life threatening, but vastly irritating is when the Dial Up Networking dialog won't remember your password.

Microsoft's fix is to open the Network applet in Control Panel and ensure that Client for Microsoft Networks is in the components list.

If not, click Add, then Client, then Microsoft, and pick it. Click OK and in the Network dialog change the Primary Network Logon field to Windows Logon. Sometimes you need to investigate further, as explained in Knowledge Base article Q148925. Another option is to go into Users in Control Panel, create a new user name and log on to Windows with that.



Not having the Client for Microsoft Networks installed could be the reason why your ISP password is not remembered.

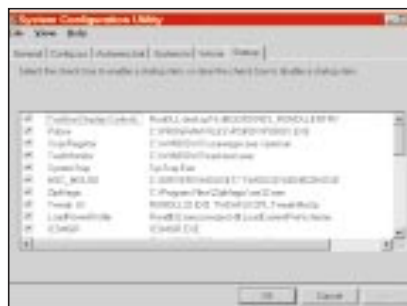
### 6 Net connection when Windows starts

Here are a few quick fixes you can try before diving into Knowledge Base article Q175312 which tackles the subject at length.

Some viruses cause this problem, so make sure your scanner is up to date and working. Second, run Regedit (Start / Run and type Regedit) and drill down through HKEY\_LOCAL\_MACHINE \ Software \ Microsoft \ OLE. If the EnableRemoteConnect value is set to "Y", double-click it and change to "N" (without quotes). Close Regedit.

If there is still a connection attempt, you need to pick through the programs that run at start-up. One or more of these may be set to dial the Net. The easy way to disable individual programs is with the System Configuration Utility – type Msconfig into the Start / Run dialog. Pay particular attention to the Startup tab.

You can un-check boxes to disable programs running automatically, and home in on the culprit over repeated boot-ups.



The System Configuration Utility is the best way to disable selected programs from running at start-up and saves a lot of mucking around otherwise. You can also use it instead of Sysedit to change autoexec.bat, config.sys and so on.

### 7 Stack overflow error

This warning crops up amazingly often, but it's usually intermittent and non-fatal so people tend not to complain. It happens when memory reserved for internal communication between Windows and certain hardware devices is used up. Try this quick fix: go to Start / Run, type SYSEDIT and press [Enter]. Click on the CONFIG.SYS window. Look for a line beginning 'STACKS='. If there isn't one, create it anywhere. Make the line:

```
STACKS=64,512
```

Select Save on the File menu. Close Sysedit. The change takes effect after rebooting and increases the size of the problematic memory buffer.

If you still see errors, follow the troubleshooting steps in Knowledge Base article Q145799.

### 8 File associations hijacked

For example a painting program grabs all the graphics file associations displayed in Explorer. After uninstalling the program the associations don't revert to the original settings.

Open Explorer, press [Shift] and right-click one of the affected files. Choose Open With from the context menu. Pick a different application from the list that's presented next. Tick the 'Always use this program...' checkbox, and then click OK. Repeat for the other file types.

Some programs prevent re-association by grouping several file extensions under one type. Break the link by going to View / Folder Options in Explorer. On the File Types tab select the grouped entry and hit the Remove button. You can now follow the procedure above.

Knowledge Base article Q133217 may also be of interest – it explains how create multiple associations for one file type.

### 9 Explorer opens on start-up

The number-one cause is a failed attempt to run a program whose path is incorrectly written. An extra space is favourite – Windows reads the path up to that point and can't proceed. Since the path





so far specifies a folder, Explorer is opened. Use the System Configuration Utility (Msconfig.exe) to find the bad entry. You could just disable it, but it's better to find where it lives and correct the problem there.

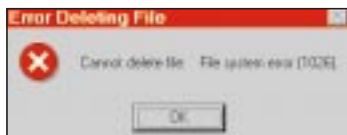
Programs can be started from: System.ini, Win.ini, several places in the registry and from the StartUp folder (under Start / Programs). If you need to search the registry, run Regedit and go to Edit / Find. Type the entry as it appears in SCU. Once found in a Run or RunOnce key, double-click the entry and correct it. Close Regedit afterwards.

## 10 Illegal filenames

When a program crashes, junk data can be dumped on to the disk resulting in corrupted files. These tend to belong to running programs or the operating system. System File Checker and Registry Checker may pick up problems, and reinstalling Windows and affected programs over the top of themselves often patches the damage.

The other thing that may happen is that some filenames are sprayed with characters not allowed by Windows. When you try to rename or delete such files, Explorer ducks out.

Many clever tricks have been devised to resolve this, but people often miss the easy way out: run ScanDisk, click the Advanced button, and make sure 'Invalid filenames' is turned on. Then set ScanDisk going. This usually works.



Got one of these? You can jump through hoops trying to get rid of it, but the solution is easier than you think.

## GOING ON-LINE

# Hidden Internet resources

*Before you call a professional check out these free options*

**F**or problems with Windows and other Microsoft products, try the MS Knowledge Base following the instructions elsewhere in this feature. Also try the Windows 98 help file – it contains many troubleshooters which have been known to work.

The best source of free help is Internet newsgroups. Most questions have been asked and answered there before, so check previous postings at [www.deja.com](http://www.deja.com). Type keywords likely to appear in messages dealing with your query. Also drop in on PC Plus' own newsgroups at [www.pcplus.co.uk](http://www.pcplus.co.uk). The wealth of freely shared expertise is what makes the Net so valuable.

It is also worth searching the Word Wide Web – try the engines at [www.northernlight.com](http://www.northernlight.com), [www.google.com](http://www.google.com), [www.alltheweb.com](http://www.alltheweb.com) and [www.mamma.com](http://www.mamma.com).

The ultimate user-to-user help resource – [www.deja.com](http://www.deja.com). We just typed in 'Windows 98 shutdown problem' and got as many takes on the answer as you could possibly hope for.



## UNLOCKING OUR BRAINS

# 11 maintenance tips the experts use

*Follow our simple survival plan and Windows should live to a ripe old age*

**E**ventually you will want to plan an orderly reinstallation of Windows for its Viagra-like effect on performance and stamina. Okay, it's a nuisance, but a planned reinstallation is better than having it forced on you by sudden failure. Here's how to help ensure that doesn't happen.

1. Disaster recovery usually starts with an emergency startup disk, so make one now! Go to the Startup Disk tab of Add/Remove Programs in Control Panel and follow the prompts. Write-protect the disk afterwards.
2. Install a virus scanner and keep it up to date. InnoculateIT is free from [www.cai.com](http://www.cai.com).
3. Use the BIOS set-up screen to make the PC boot directly from drive C:, bypassing A:. This helps prevent accidental virus infection from a dodgy floppy left in the drive.
4. Use a backup program every day. Even if it only saves important data files between major backups, and even if it's just MS Backup or a batch file copying important data to a partition on another drive, that's a million times better than nothing. Always make such a backup before installing a new program, defragging the disk or repartitioning.
5. Run ScanDisk and Defrag once a month. ScanDisk may pick up a developing problem or weed out hidden glitches which have knock-on effects elsewhere. Defrag doesn't improve reliability, but it does help maintain speed.
6. Use System File Checker and Scanreg before every software installation – see the section on DLL hell.

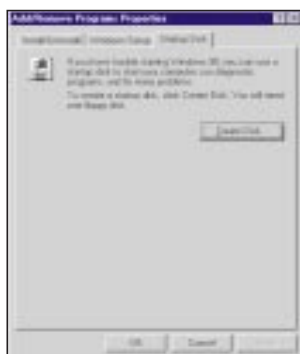
7. Watch the amount of free space on your Windows drive and the amount of free system resources. Odd problems occur when either gets low. Run a spot check on resources by typing Msinfo32 into the Run dialog. Anything much below 40 per cent puts you in the flakiness zone.
8. Keep it simple! An ornate Windows installation adorned with interface enhancements, OTT screen saver, three-inch system tray and staggering font collection may be as sexy as stilettos, but it's just as slow and accident-prone.
9. Make a point of removing unused software.
10. Large hard disks open up possibilities like maintaining a separate Windows installation you can dual-boot to for testing new software. This will prevent a serious problem killing your working copy and stave off file bloat caused by inefficient uninstallers. To do this you need a partitioning tool and a boot manager. PowerQuest's PartitionMagic is famous, effective and expensive. There are free options if you know what you are doing – for example, see [www.users.intercom.com/~ranish/part/](http://www.users.intercom.com/~ranish/part/).
11. Windows updates are available from the following Web site: [www.microsoft.com/windows98/downloads/corporate.asp](http://www.microsoft.com/windows98/downloads/corporate.asp) but can sometimes cause trouble where there was none before. A good tip is to remember to only install updates to correct specific problems or gain features you know you want. The same applies to updated drivers from manufacturers.



# The secrets of a perfect re-install



Re-installing Windows is the key maintenance task. Everyone has to do it sooner or later. Getting it right can save time, trouble and tempers. **Tony Hannan** reveals how to do it



A start up disk can dig you out of a hole if you have start up problems.

**Y**ou don't have to put up with poor performance and constant crashing. With a little preparation and these handy instructions, a clean reliable install is just an hour or so away.

There are two ways that you can reinstall Windows and as with everything else in life the best way is the hard way. What you lose in time you gain in effectiveness. Simply put, you will never achieve the same improvements in performance or getting rid of discarded files and conflicts by reinstalling Windows on top of your current system (although we will show you how to do that too).

## Reinstalling Windows from scratch

This takes a little longer than reinstalling over your current system but replaces all redundant files and replaces all your drivers to ensure the cleanest installation possible. The advantages of this are many: it clears out bulging temp folders of any files clogging your system, it fixes any corrupt files and it speeds up your system, improving reliability.

You will need to prepare for this and do the following:

- Make a Start up Disk. You should really have one of these anyway. Don't worry if you haven't – making one is straightforward. Just click on 'Start/Setting/Control Panel' and 'Add/Remove Programs' then select the 'Start Up Disk'. Use a blank formatted floppy disk and then click on 'OK'. Windows will now create a start up disk for you.

- Back up your data files. Be selective here, there are probably files you've backed up that you're never likely to use. Don't backup any applications or programs, reinstall these from your original discs after you've reinstalled Windows.

- Dig out the Program discs for the software you wish to reinstall. Remember that re-installing from scratch wipes out your applications, data and everything, so remember to back up.

- Back up any drivers for the components of your machine. It really is worth taking the time to download the latest drivers that you will need for your cards, even the correct monitor driver will work better than the generic 'Plug and Play Monitor' that will otherwise install.

Once you have prepared and are sure that you have your data files backed up, then you are ready to begin.

Boot your system using your Start up Disk. Check that it works successfully and allows you to 'Start Windows Set-up'. Choose the option 'Start with CD ROM support'.

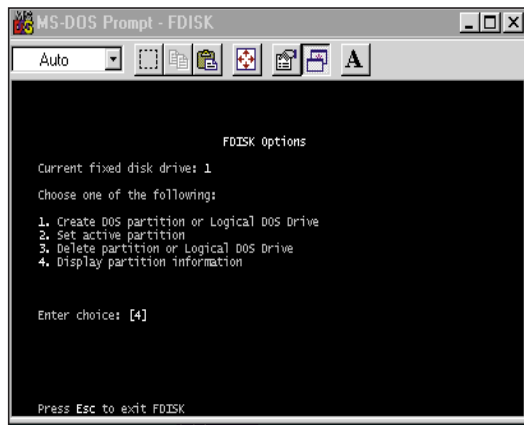
At the 'A' prompt type 'fdisk' – this will bring up a menu as shown in screenshot 2.

To view the current partitions press '4' and enter. Generally it is a good idea to divide your drive into at least two partitions, one primarily for your programs and the other for your data. Delete all the partitions on your drive by selecting option '3' – you will get a warning that all data will be lost, this is the point of no return. Once this is done you need to recreate the partitions to whatever size you wish, split the drive into fairly even partitions.

Fdisk creates two types of partition 'Primary' and 'Extended.' First create the 'Primary' partition and then create your extended partition; Fdisk will then prompt you to create your logical drive or drives. If your drive is less than four gigabytes don't partition your drive into more than two parts. Finally check that your partitions are set up as you want by selecting option 4. Once you're happy with your set-up you need to reboot and format your drives.



The Device Manager can help you troubleshoot typical re-installation problems.



Fdisk enables you to reformat your drive prior to re-installing Windows.

When you reboot ensure that you select 'CD ROM support'. Once you have rebooted your system, format the drives for each partition. To do this type in 'Format /U/V C:'. The two switches U and V make the format Unconditional, and Verify that it has been performed correctly, and that the drive has no bad sectors. When you have reformatted all your partitions you are ready to reinstall Windows.

### Inserting your Windows CD

Insert your Windows CD into the drive and type 'Set-up' at the 'A' prompt. Windows Set-up will now start. Scandisk will now run but should take no more than a few seconds (there is very little there to check).

Follow the step by step instructions as shown, there are several different versions of Windows so the walkthrough is just a guide.

Always select the default Windows directory to ensure that all programs installed run correctly. The next screen gives you the 'set-up' options – choose 'custom' – this will enable you to select only the components that you want. Then for geographical location, choose the country that you are in.

Windows will now want to create another 'Start-up' disk and we recommend that you do. Use another blank formatted floppy disk and clearly mark the disk mentioning the reinstall and the date. The drivers that you prepared earlier for your peripherals will now be required.

The 'add new hardware' wizard appears and the first the monitor drivers and then the graphic card driver will need to be installed. Insert your CD or floppy disk in the drive and select 'Let Windows Search for Driver'. Once you have done this install your graphic card drivers in the same way.

That's it, Windows is reinstalled.

### Solving re-installation problems

To find out what Windows thinks you have

#### QUICK AND EASY

## Reinstalling Windows over your current system

*It's the fastest, although not the most comprehensive, problem solver*

**B**y reinstalling Windows in this manner you will replace files that are corrupted or that have been overwritten with incompatible versions. You will not overwrite redundant files or drivers from devices that have been removed so you will not remove any conflicts you may have. It isn't essential that you make a backup of your files but it's better to be safe.

### Reinstalling from Windows

If your current installation enables you to get into Windows then you can reinstall this way. Insert

your CD into the drive and from 'Start' click on 'run' and type 'D:\setup' (where D: is your CD ROM Drive letter). Set-up will then begin again. Select 'custom' when prompted, so you only install the files that you require.

During reinstallation Windows may tell you it has found a file that is newer than the one it is about to install. Install the older file. There may occasionally be some problems with some applications but just reinstall these over your current copy. In around 30 to 40 minutes your installation should be complete.

installed, right click on 'My Computer' on your desktop and then click the 'Device Manager' tab. Go through the list to check that your hardware is installed as it should be.

If Windows has a problem with a device it will have yellow triangle with an exclamation mark next to it. Click 'properties' to get more information on what is wrong. Usually the driver that Windows has installed is not the right one for the device. Remove the device from the system by highlighting it and clicking on 'remove'. (See screenshot 3.)

You then need to reinstall your hardware through the 'Add New Hardware' icon in the Control Panel.

Occasionally Windows Device Manager will not list a piece of hardware that you know you have got attached to your system then again you need to go to Add New Hardware.

As Windows hasn't found the device the first time round it is unlikely that it will now. Click on 'No I would like to select the hardware from a list' and select the type of hardware from a list.

If it isn't there then select 'other' and load the drivers for your device when prompted through the 'have disk' tab. You should now have a cleaner, safer, slicker system.

#### DOS AND DON'TS

## Reinstalling Windows from Scratch

1. Back-up your data
2. Update and backup your drivers
3. Make and test your boot-disk
4. Ensure that you have your Windows product key to hand.
5. Format your hard drive before checking that your Start-up disk enables you to access your CD-ROM drive.
6. Back up programs
7. Do not install Windows into a different directory. It will confuse Windows and other programs you install.
8. Do not partition your drive into lots of tiny segments – two or three is ideal.
9. Once you have finished your installation, copy the contents of the Win98 folder to your hard disk – this will make things much quicker when you reinstall again.



# The secrets of... automating Windows



After the recent outbreak of the 'I love you' virus, a VB Script, **Paul Warner** takes a closer look at scripting and discovers how it can save you time rather than cause you trouble

Scripting can enable you to produce some astonishing results quickly and easily.

**Y**ou could be excused for thinking that something with a name like JavaScript or Primal has more to do with cavemen than programming but these are the names of just a couple of 'Scripting languages'. Scripting has been associated with the development of Web content and provides a way to include dynamic content within the HTML code of your Web page. Instructions are read and processed by the Web server and displayed on the page.

However, in the time scale of computers, scripting has been around since the Stone Age. In the simplest form, it is a text file containing a set of instructions. These are processed or interpreted by an application or operating system to carry out each instruction in turn. If you're familiar with DOS, then you may have been writing scripts for years and not even realised it. Take, for example, the config.sys and autoexec.bat files that are automatically run at system start-up.

Both these text files are effectively script files – files of text which explicitly tell the operating

system to install different drivers, set up the environment and run certain programs. You may well have used the old Basic that comes with DOS. This again is a text file or script that is processed or 'interpreted' by the Basic application. Many computer languages have been developed to interpret text the only drawback was the time it took to process the instructions. The answer was to take the source text and convert the instructions directly into executable binary code, in other words to compile them into programs. This speeds everything up but you lose the convenience of editing the text and running it.

The standard .bat or batch file used under DOS has been the stalwart of many computer users and even in today's Windows environment, it is commonly used to perform regular tasks like backing up data files, installing software or running programs. However, it's a sad comment that Microsoft didn't originally carry over this facility into a Windows-based batch processor. They did include a program called Recorder that remembered keystrokes and mouse use. This was more like a macro generator and saved a set of actions so that they could be played back.

If you have a recent version of Internet Explorer then try this out. Open Notepad and type in the following text line – MsgBox 'Hello World' – without the hyphens. Next, save the file as something like 'hello.vbs'. It's the .vbs extension that's important; this tells your system that it's a Visual Basic Script file. The next step is to find the file with Explorer and double click on the file name you should have created and run your first VB Script using the Windows Scripting Host (WSH). The recent 'I love you' virus has a .vbs extension. When you open your mail the script is run and the damage done.

## Windows Scripting Options

Windows Scripting Host enables scripts to be executed directly on the Windows desktop or command console, without the need to embed those scripts in an HTML document.

WSH isn't memory hungry and so is ideal for non-interactive scripting needs such as logon scripting, administrative scripting, and anything







else you fancy having a go at. Microsoft currently provides three hosts for running these scripting languages across the Windows platform:

Microsoft Internet Explorer  
Internet Information Server (IIS)  
Windows Scripting Host (WSH)

Internet Explorer enables scripts to be executed on client machines from within HTML pages. Internet Information Server (IIS) and Personal Web Server now support Active Server Pages, this enables scripts to be run on Web servers; in other words, you can run server-side scripting over the Internet or an intranet. ActiveX scripting enables powerful scripting using VB Script.

WSH supports all the standard features of both JavaScript and VB Script languages, including subroutines and functions, variables and arrays, true if/else statements, other flow-control statements that allow sophisticated looping and much more.

If you want to try the JavaScript element, write some simple code but this time give it a .js extension. The main difference between the two is that JavaScript tends more toward using self-contained 'Objects' while VB Script relies more on built-in functions.

For instance the following code creates a variable in JavaScript named MagazineName and loads it with the text 'PC Plus'

```
Var MagazineName = "PC Plus"
```

You can return the length of the string by checking the length property of the new object 'MagazineName' with the code

```
Len = MagazineName.length
```

Or extract a single character from within the string by calling the charAt property

```
Char = MagazineName.charAt(5) -
```

this should return an l

To do the same thing in VB Script you'd have to call standard built-in functions and the equivalent code would be.

```
Dim MagazineName
```

```
MagazineName = "PC Plus"
```

Then use the Len() function to check its length

```
Length = Len(MagazineName)
```

Or the Mid() function to extract a character

```
Char = Mid(MagazineName,5,1)
```

The choice is yours, if you've had experience of VB or even the venerable, creaking old GW Basic (that stands for Gee Whiz apparently) you'll probably be happier with VB Script. C++ advocates will probably opt for JavaScript.

## FIRST STEPS

# Startup files in DOS

*You may have been writing scripts without even realising*

**A** typical DOS or Windows boot would process the config.sys and autoexec.bat text files at the top level of your boot drive.

For example:  
A file called Config.sys could contain.

Device = Himem.sys – install a memory manager.

Device = CDROMDriver.sys –

loads a CD-ROM driver into memory for processing by MSCDEX.EXE

DOS = High, UMB – makes unused upper memory (above 640) available for DOS and drives. This leaves more room for programs that run in DOS (Yes they still exist)

And the AUTOEXEC.BAT (This is called a batch file) will set up

paths, system variables and execute different programs.

SET BLASTER=A220 I2 D3 H7 P330 T6 – Set up your sound card

keyb uk,,C:\WINDOWS\COMMAND\keyboard.sys – use a UK Keyboard

PATH=C:\Program Files, C:\Windows etc.... – Tell your system where to find files

## Security considerations

WSH doesn't include functions that allow scripts on a server to work with hard disk files. What great fun hackers and crackers would have writing applets that delete everything on your hard drive in a couple of lines of code, just from viewing a Web page!

And for security reasons, Microsoft hasn't included Registry manipulation functions in the JavaScript and VBScript languages, in order to prevent a malicious Web page from destroying information on your hard disk. Instead, it implemented WSH's Registry functions as methods embedded within WSH itself. This makes them available to local scripts running under WSH on a user's computer, but deprives Web-based scripts of this capability. So, a 'I Love You' type virus, which is run locally on your machine, can change and destroy your Registry quite easily.

If Microsoft implements the same approach with hard disk I/O functions, allowing scripts to work with disk files and directories without relying on external programs, then, WSH might become the replacement for the old DOS batch files that have been around for so long, but only at the expense of increasing the risk from 'I Love You' type viruses.

## Scripting Languages

HTML programmers will use Scripts entered directly within a web page, this usually requires identifying the script language and entering the script code directly within the page. You're not restricted to using the Scripting engines built into Microsoft's environment. Many other engines are available for purchase or download and classic languages like Perl are freely available. Take a look at our Perl series in 'Hands On' to get an idea.

Another scripting language that's in danger of acquiring cult status is PHP. In Web programming, PHP is a script language and interpreter, similar to ASP, it is open source and freely available. You can download the source and binaries from [www.php.net](http://www.php.net). PHP (the initials come from the earliest version of the program, which was called 'Personal Home Page Tools') is a cross-platform alternative to Microsoft's Active Server Page (ASP) technology. As with ASP, the PHP script is embedded within a Web page along with its

HTML. Before the page is sent to a user that has requested it, the Web server calls PHP to interpret and perform the operations called for in the PHP script. An HTML page that includes a PHP script is typically given a file name suffix of '.php' or '.php3.' PHP has great strengths in database connectivity and with a similarity to C and Perl it has become a favourite scripting language for Web database application development. PHP and ASP are different kinds of scripting languages to VB Script, JavaScript and Perl. They operate solely on the server and simply change the HTML that you see in the browser on a connected PC.

The range of languages is growing daily, have a quick look on the Web and you'll be amazed by the number. See our *SuperDisc* for a few!

## HANDY RESOURCES

# Some useful scripting contacts

*We've put together a few useful Web sites that contain information and downloadable script engines. Check them out:*

## [www.scripting.com](http://www.scripting.com)

A great place to check out what's on in the scripting world and a lot more.

## [www.php.net/](http://www.php.net/)

Download PHP 4.0 (source code and Windows binaries distributions available). Get the latest documentation and source code samples.

## [www.scripting.com/frontier/beginning/whatFrontierIs.html](http://www.scripting.com/frontier/beginning/whatFrontierIs.html)

Investigate Frontier – one of the latest.

## [www.beanshell.org](http://www.beanshell.org)

Beans are good for the heart and Java. Check out the most useful ones here.

## [www.python.org](http://www.python.org)

Tidy scripting in this alternative to Perl.

# How to use form controls in Excel



*Forget entering data into an Excel worksheet by hand. Helen Bradley shows you how to use spinners, sliders and option buttons instead!*

**T**hey're probably Excel's best kept secret – the spinners, sliders and option buttons you can use to alter figures in your worksheets. But they're easy to use and, let's face it, a heap of fun too. We've put the spinner controls together on a simple savings calculator so you can test them out and, as a side benefit, make some handy savings calculations as well.

The savings calculator lets you to set your target savings goal in today's pounds with your projected interest rate and rate of inflation. It uses these figures to calculate what your target savings goal will be in future pounds (given inflation) and how much any savings you already have will represent in future pounds (given the interest you will earn over the years). It then calculates the shortfall and estimates how much you must save each month to reach your target.

The fun part about this project is the spinner controls used to set the key inputs into the spreadsheet – they give your finished product a smart look.

## The basics

To create this project you'll need Excel – We've used Excel 2000 but any version from 5 up will do. Begin with a new workbook and type these cell entries into it:

Cell	Entry
C3	Savings Calculator
C4	Value in today's £
C6	Inflation rate
C8	Future target value (inflated)
C10	Years to save
C12	Current savings
C14	Interest rate
C16	Savings (monthly compounded value)
C18	Additional funds required to reach goal
C20	Monthly savings required to reach goal
J4	3500
J6	300
J10	5
J12	1000
J14	500
E4	=J4*10
E6	=J6/10000
E8	=FV(E6,E10,0,E4,0)*-1
E10	=J10
E12	=J12*5
E14	=J14/10000
E16	=FV(E14/12,E10*12,0,E12,1)*-1
E18	=E8-E16
E20	=1/FV(E14/12,E10*12,1,0,0)*E18*-1

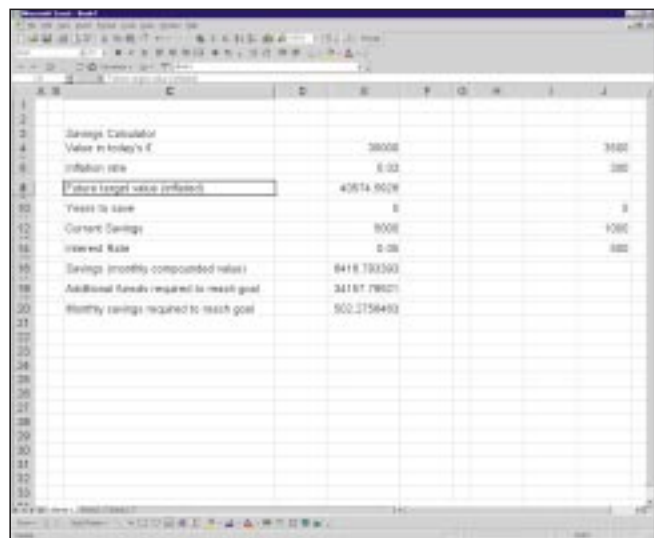
To format the sheet, reduce the width of A, B and G, and widen C and E. Decrease the height of rows 5, 7, 9, 11, 13, 15, 17 and 19.

**The form controls turn ho hum worksheets into a visually exciting tools for making calculations**

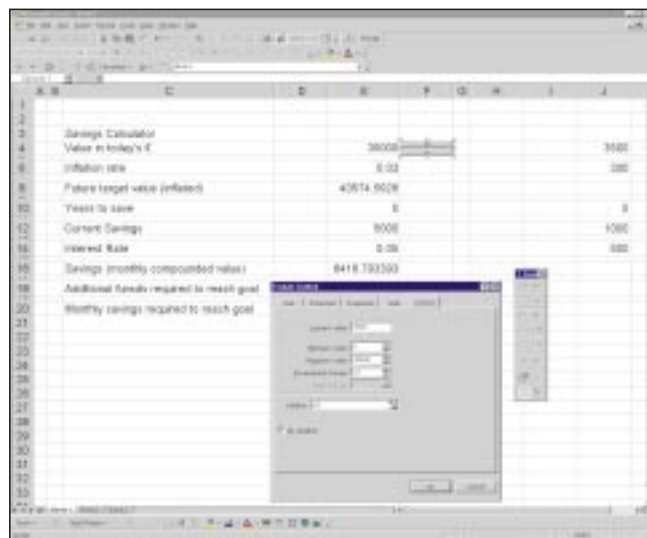
To add the spinner controls first display the Forms toolbar – View, Toolbars, Forms – then display the Drawing toolbar – View, Toolbars, Drawing. Choose Draw, Snap, To Grid so your spinner controls will be easier to position on the worksheet.

Select the Spinner button from the Forms toolbar and click and drag over cell F4 to add the spinner. Right-click the spinner and use the sizing handles to adjust its size and drag it into position in the cell. Right-click the Spinner again and select Format Control from the menu. Select the Control tab and set these values: Current value: 3,500; Minimum value: 0; Maximum value: 30,000; Incremental change: 10; Cell link: J4; and select the 3D shading checkbox. Select

The bare bones of the savings worksheet is a series of headings and formulas which calculate the amount you need to save each month to reach a future savings target.



The spinner control's settings are entered in the Control tab of the Format Control dialog.





## AT-A-GLANCE

# Excel's form tools laid bare

Excel has a number of handy form controls you can use on your spreadsheets

### Group box

This control is useful for grouping option buttons so that they work correctly. Selecting one will automatically disable the others.

### List box

This displays a list of items and it can be set so that only one can be chosen or the user can make multiple selections.

### Forms toolbar

The Forms toolbar contains all the tools relevant to adding and manipulating controls on a worksheet.

### Option buttons

These are useful in circumstances where you must choose between a number of options and where only one can be chosen.

### Checkboxes.

Checkboxes are useful for options which can be selected or not and where it makes logical sense to have one or more selected.

### Button

Buttons are controls which you can link to Excel macros so you click the button to run the macro.

### Label

Use labels as identifiers for your controls.

### Scroll bar

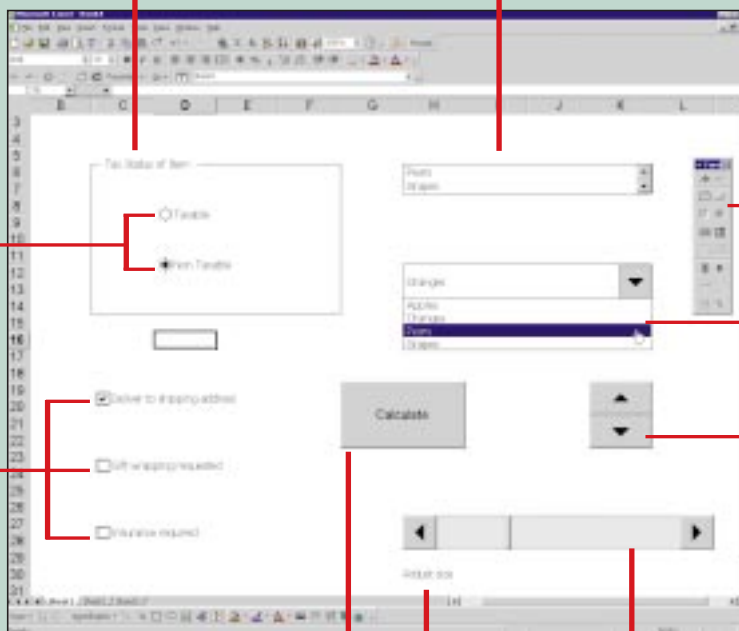
This allows you to slide the box or click the arrows to move in a small increment and click between them to move in large increments.

### Combo box

This displays a list of items from which only one can be chosen.

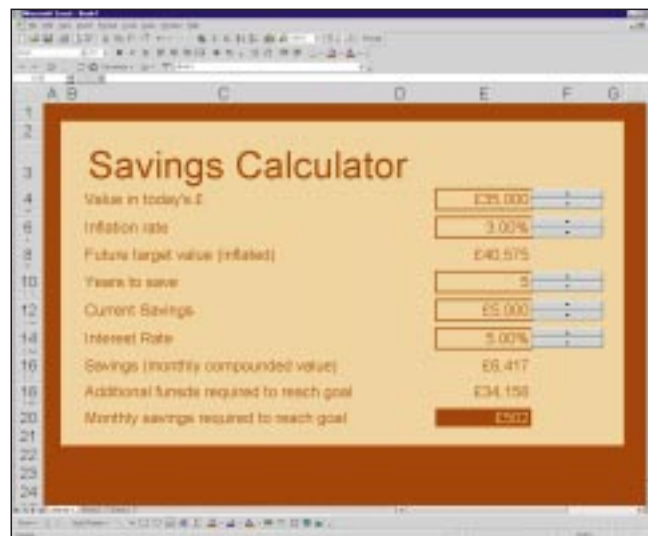
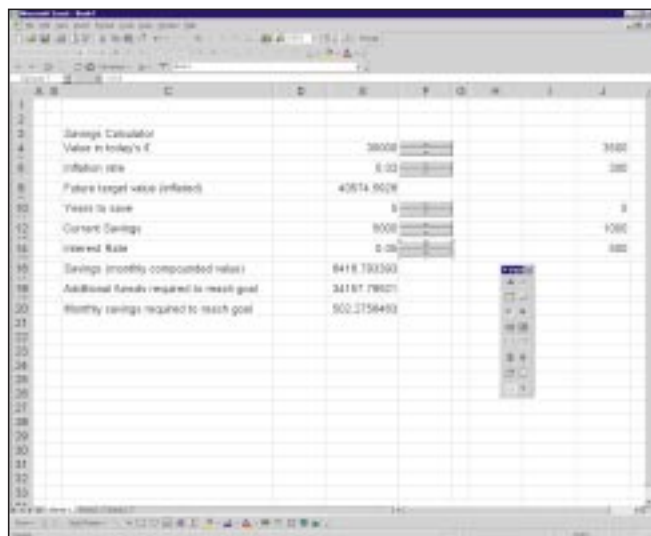
### Spinner

Clicking the spinner control arrows varies a number by the increments you specify in the control's properties.



When you're done adding spinners, you'll have one for each of the cells which contain data you can change in your worksheet.

The completed savings calculator with its spinners in place and ready for you to make your own calculations.





## WALKTHROUGH

## Create a drop-down list

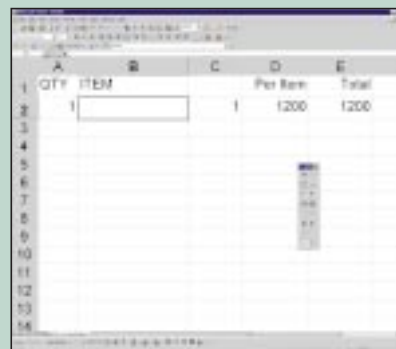
A drop-down list enables you to choose a pre-defined item. Here it's used to return the price of a computer from its description



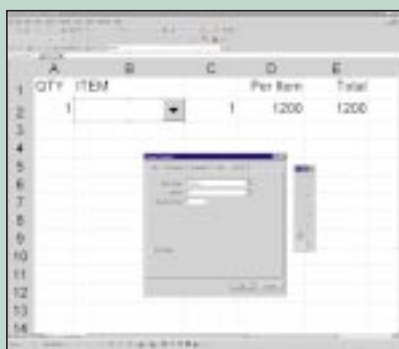
**1** This two sheet workbook contains data about the range of PCs sold in the range of cells A1:C5. An item code appears in column A, the description in column B and the price in column C.



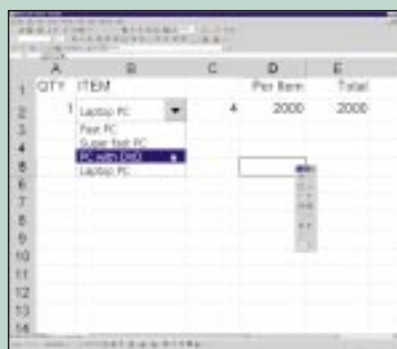
**2** To make it easier to refer to the area containing the data name it, calling it 'PCprices' using Insert, Name, Define.



**3** The second sheet in the workbook will contain the drop-down list and the calculations which will result from it. The drop-down list will go in cell B2 so widen it to accommodate the control.



**4** Add a combo box to the worksheet using the Combo tool on the Forms Toolbar. Right-click it, choose the Control tab and set the Input range to PCprices, set the Cell link to C2 and click OK.



**5** Try out the new combo box. Notice that, when you select an item from the combo box, the prices on the worksheet change accordingly. Hide column C – its data is integral to the worksheet but it doesn't need to be visible.



**6** When you select a PC, the combo box returns a value in cell C2 representing the position that the PC is in the data list. The INDEX function locates and returns the price of the item from the remaining data.

the Properties tab and choose the 'Move but don't size with cells' option button and click OK.

This is all you need to do to add and format a spinner for your worksheet to control the sizing of one of the inputs into the worksheet. You should now repeat these steps to add four more spinner controls to the worksheet. In each case use the Control tab to set the values and then choose the Properties tab to select the 'Move but don't size with cells' option button before you click OK to finish.

Format the worksheet data using currency formats for cells E4, E8, E12, E16, E18 and E20. The number in cell E10 is a number of years so format it as whole number and format as percentages with two decimals places the numbers in cells E6 and E14.

Neaten up the remainder of the worksheet by formatting the text and cell backgrounds using the Fill Color and Font Color buttons from the drawing toolbar and the cell border options (Format, Cells, Border). When you're done, save your workbook as savings.xls.

## Using the calculator

To use the savings calculator and, in particular the spinners, click with your mouse on the spinner arrows to increase or decrease the values in the cells in column E. You can do this to test your own values. For example, set your target savings amount in today's pounds using the first spinner. If you wanted to save a deposit for a house you might target saving ten per cent of the cost or £20,000 in today's values.

You will set the current inflation rate using the second spinner – this is currently very low so try around two per cent. Use the third spinner to set the number of years which you'll allow yourself to reach your goal and set the fourth spinner to set the amount you already have saved (if any). The final spinner is used to set the interest rate you are currently getting on your savings (or which you can expect to get on them).

When you've done this, cell E8 will show you what your target savings goal will be in future pounds (taking into account inflation). In cell E16 you can see what your current savings will

### KEYBOARD SHORTCUTS

Add a spinner to this cell	Current value	Minimum value	Maximum value	Incremental change	Cell link
F6	300	0	2500	1	J6
F10	5	1	40	1	J10
F12	1000	0	30000	1	J12
F14	500	0	2500	1	J14



## DO IT BETTER

## Top tips for form controls

*Learn the secrets of form controls and they'll be even more productive*

### Right-click selection

Once you've added a spinner or other form control to your worksheet you won't be able to left-click it to select it to change its properties – because left clicking it actually selects it for action. To select a control so you can make changes to it, hold your mouse over it and right click instead.

### More information on controls

Excel Help lacks good information about the form controls. However, you can get information direct from Microsoft's knowledge base by sending an e-mail to: [mshelp@microsoft.com](mailto:mshelp@microsoft.com) and include these Knowledge base file numbers in the subject line: Q171706 and Q142135.

### Option buttons

Use option buttons inside a group box where you have an item which can be only one thing or the other and not both. For example, to select

between taxable and not taxable or between monthly or annual payments. Inside a group box only one option button can be selected and all others are automatically deselected.

### List boxes

Using a list box enables you to set it so your user can choose one or multiple selections from the list. To select the option to use, choose the Control tab and choose Single, Multi or Extend, your user can use the Shift and Control keys to make multiple selections.

### Scroll bars

Use a scroll bar when you want to be able to skip through a range of numbers in large or small increments. Clicking the scroll arrows moves in the smaller increments and clicking between the scroll box and a scroll arrow moves you in the larger (page change) increments.

grow to become over the period of time you have allowed to reach your goal given the current interest rate.

Cell E18 shows the shortfall between what your savings will have grown to and what your goal amount is at the date you want to have reached your goal. Finally, cell E20 shows you the monthly savings you should put away to ensure you reach your goal in the timeframe you have set.

These figures are, of course, approximate and the exact amount you must save will depend on the actual interest rate and inflation rate over the intervening years – but you'll get a handy guide from the figures you enter here.

## How the spinner control works

A spinner control is capable of returning an integer or whole number value between 0 and 30,000 in the cell which it is linked to. If you need a whole number somewhere in this range you can use the number the spinner gives you 'as is'. Most times however, you'll need a range of smaller or larger numbers so the value the spinner gives will have to be scaled either up or down to get a useful range of numbers.

In this worksheet the actual spinner value can be used for only one amount, the number of years you will be saving for. The range of years is 1-40 and only whole years are used for the calculation. The spinner in cell F10 has been set to give a

## You'll get a handy guide from the figures you enter here

minimum value of one, a maximum of 40, with an increment of 1. Every click of this spinner's arrow takes the value in cell J10 up or down one integer in the range 1-40 (it won't go any higher or lower than these values). Cell E10 contains a link to cell J10 so every time cell J10 changes cell E10 changes, too.

For the spinner calculating your target savings goal and your current savings the calculations are more complicated. We've assumed a savings value of between £1 and £300,000 is a good range. So, for the spinner in cell F4 we've set its minimum value is set to 0, its maximum to 30,000 and the increment to 10. Every click of this spinner takes the value in cell J4 up or down within the range 1-30,000 in steps of 10 (that is, 0, 10, 20, 30... 30,000). The target savings amount is calculated in cell E4 by a formula which multiplies the spinner value (cell J4) by ten thus scaling up the spinner value by a factor of ten. This results in a target savings range from 0 to £300,000 – Click the spinner and the amount changes by £100.

A more complex scaling is required for the inflation and interest rates. Inflation and interest rates are typically small numbers in the range 0 per cent – 25 per cent (0 – .25). To get these values the number the spinner returns must be scaled down considerably. The spinner in cell F6 controls the inflation rate, it returns numbers in the range of 1-2500 in cell J6. The formula in cell E6 divides the spinner value from cell J6 by 10,000 to give an inflation rate from .0001-0.25 or .01per cent -25 per cent in steps of .01per cent.

Excel's future value (FV) function is used to calculate the future value of your savings and target savings goal. Subtracting these from each other gives you the value of your shortfall and then a sinking fund calculation (the inverse of a FV) is used to calculate the monthly amounts you'll need to save to meet the shortfall. The syntax of the FV function is:

```
=FV(period rate of interest, number of periods, period payment, present value, payment type)
```

The trick to using this function is to ensure you match the interest rate to the number of periods. If you make monthly payments then you must use a monthly rate of interest (annual rate/12). **PCP**

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### NEXT MONTH

We delve deeper into the Office Application Interface.

## HANDY HINT

## Protecting your worksheets

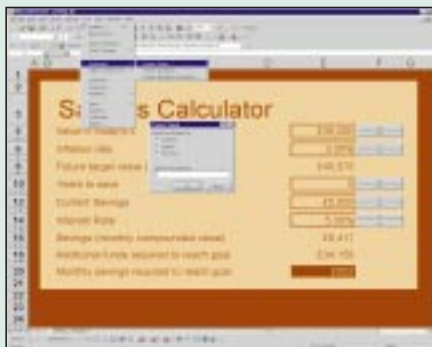
*Don't let a careless user overwrite your precious functions*

**T**his savings calculator spreadsheet is a little vulnerable to accidents. This is because the cells in column E contain formulas and it is all too easy to type a number over them and thus disable the spinner – messing up your hard work.

To protect the worksheet you'll need to prevent changes from being made to it. Do this by first 'unprotecting' the cells the spinners use in column J. So, highlight cells J4:J14 and select Format, Cells, Protection and deselect the Locked checkbox and click OK.

Now hide column J as the figures are being stored here for use in the actual worksheet. They are, at best, misleading and it makes good sense to hide them so they don't confuse you. Hide column J by selecting the column heading

and select Format, Column, Hide. The final step is to protect the worksheet – do this by selecting Tools, Protection, Protect Sheet, select all the checkboxes and select OK. Don't bother adding a password as you are really only protecting against accidental alterations.



Protecting the worksheet will ensure that you can only make changes to it using the spinners and your formulas can't be accidentally deleted.

# Jazz up your Web site with Flash

Learn how to liven up your Web site up and add more interactivity. Susannah Hall shows you how



**L**ast month we introduced the basics of creating Flash films. This month we'll introduce you to techniques that will enable you to produce much more interesting and complex interactivity. Look on the *SuperDisc* for a simple project illustrating the techniques. Once you have them under your belt it's over to you to play about and work out the different effects you could produce with them.

You are going to learn how to create and manage film clip symbols. They are like mini films that run within the main film or even within another film clip. Being symbols they

can be reused over and over again, with each instance of the film clip having a different size, colour or rotation.

They are easy to create – just Insert a New Symbol and choose 'Movie Clip'. Then create your animation within the timeline before returning to the scene you are working on or creating another film clip. Each film clip you create will appear in the Library (which you display by selecting the command from the Window menu). Add them to your scene by dragging them on to the stage from the Library palette.



## Controlling your clips

You will find the film clip plays independently of your main film. Even if you add a command to tell your movie to stop, the film clip will carry on regardless. Since the film clip doesn't respond to commands made to the film you have to give instructions specifically aimed at a particular instance of a film clip symbol.

Each instance must be identified as a unique entity or 'target'. You do this by double-clicking an instance on the stage and adding an instance name under the Definition tab of the Instance Properties dialog box. You can have several instances of the same film clip on the stage all uniquely identified by their specific instance name. Once they all have instance names you are ready to control them!

You use Actions to control them just as you would for stopping and starting the main film, but to make it clear to Flash which instance you want to send the instruction to, you use the 'Tell Target' action. When you select the 'Tell Target' action you will find a list of all the Targets available on the right of the dialog box. Only instances with an instance name will appear as targets. Double-click the target you want and it will appear in the box underneath. Then you can select the command you want to apply to it – stop in this example.

There is nothing to prevent you using film clip symbols within other film clips. You can still control the embedded film clip as long as you have given it an instance name. Choose the 'Tell Target' action and the clip will appear indented under its 'parent' movie clip.

## Menus from heaven

The sample project sets up a menu screen with several film clips. The buttons that constitute the menu will be animated using film clips within the button itself. When the viewer moves their mouse over them, other film clips will stop and start. When the viewer clicks on the button a new screen will load.

There are several different ways of organising all the screens in your site. You can place them on separate scenes within one film, but having lots of scenes can be cumbersome and you'll find that to link to one particular scene in the

### WALKTHROUGH

## Making movies

Six easy steps to create film clip symbols



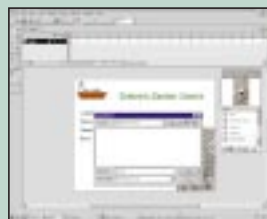
**1** We are going to begin by creating a film clip symbol. Go to Insert and click 'New Symbol' and choose a film clip symbol. Create an animation rather than a static graphic using the drawing tools and tweening.



**2** Repeat the last step until you have several film clips. Now create a new symbol but select 'button'. To create an animated button, add a film clip symbol into one of the key frames of your button.



**3** Create the buttons for your menu and place them in your film along with your film clips. Double-click the film clips and type in an instance name under the Definition tab. This will enable the buttons to control them, making them stop and play.



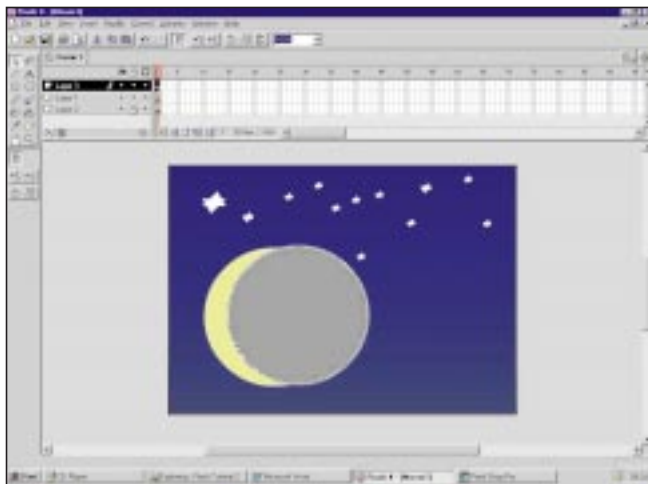
**4** Now you need to create the other films that will load when the viewer clicks the appropriate button. Export each movie using the Export Movie command under the file menu and store all the .swf files in the same folder



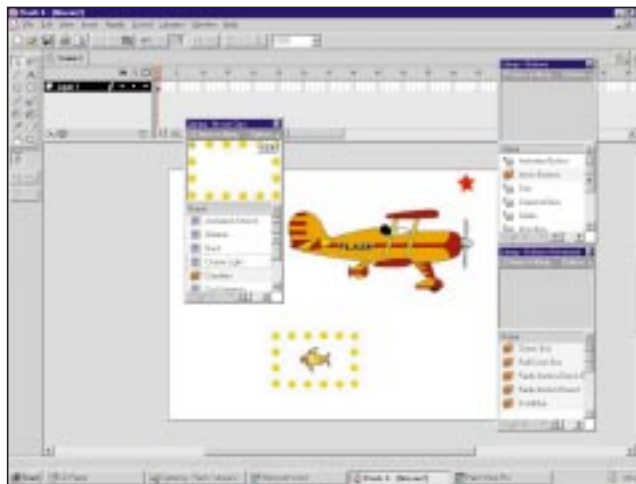
**5** Then double-click on each button and go to Actions. Select 'On mouse event', check the 'rollover' box and select 'Tell target' from the '+' button. Double-click the target name so it appears in the box at the bottom and then select 'Stop' from the '+' menu.



**6** Click 'End On' and add another 'On mouse event' selecting 'roll out' this time and making the target 'Play'. Then add an 'on release' mouse event and choose 'Load movie', specifying the appropriate film for the button and choosing Level 0. You are now ready to publish.



Create a crescent shape by drawing two circles, one on top of the other and then deleting the top one.



Flash comes with several libraries of buttons and animations which can be selected under the Libraries menu. Don't confuse them with the Library palette for your current film which can be found under the Window menu.

film from another film, will mean loading the entire movie. Surfers don't like to wait, so it's sensible to work as though each movie is the equivalent of an HTML page.

You do this by creating each screen as a separate Flash movie. You export each one as a .swf file (choose Export Movie from the File

**You will find the film clip plays independently of your main film. Even if you add a command to tell your movie to stop the film clip will carry on regardless**

menu) and save the films you want to link together in the same folder. To load another film you use the Load Movie action and choose the film you want to load.

You can load movies one on top of the other by defining which level the film is loaded into. Your initial movie is at Level 0. If you want the next film to replace it you need to specify it loads into Level 0. If you want to load films on top of one another set them up to load in at different levels. Remember that you will need to add a frame action that stops your film and waits for the command to load another.

Once you have finished you only need to Publish your starting film. This incorporates your initial movie into an HTML page to load into the browser or, if you create a projector, builds in the Flash player. The other films will then be loaded from the initial movie either into the browser or the Flash player.

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#### ADVANCED FLASH

## Using Flash's drawing tools

*Being able to create the shapes you need for your animation is easy once you know how...*

**T**he drawing tools in Flash are very versatile once you know how to use them. There are a number of fairly obvious tools. The Line, Oval and Rectangle tools are easy to use – just select the tool and click and drag to create the line or shape. You can use the Pencil tool to draw either straight or curvy lines. Once you have selected the tool, click on the button that looks like steps and choose what kind of lines you want to draw.

Shapes you draw consist of two parts – the stroke and the fill. Flash treats them as

separate objects – something you have to watch for since it's easy to start moving one without the other. To select the whole shape, double-click. It's always a good idea to Group the stroke and fill so you won't be caught out in future.

The Brush tool offers different painting modes which are useful. Explore them by trying them out for yourself, particularly Paint Inside which paints the area you have started painting in, but won't extend beyond that fill. You can also use the Paint Bucket tool to change fill colours and the Ink Bottle tool to

change stroke colours. For an object filled with a gradient use the 'Transform Fill' button that appears when you select the Paint Bucket tool to adjust the gradient positioning.

When you draw one object over another, it cuts through the object underneath. This is because overlapping strokes dissect each other and overlapping fills are joined. It might be slightly confusing, but you can use this rule to good effect when building shapes by overlapping and cutting different combinations of rectangles and circles.

#### FLASHY JARGON

## A glossary to help you...

*Flash uses a number of terms that you are unlikely to be familiar with. Find out what they mean here*

#### Key frame

Is a frame in the timeline where objects that are part of an animation change.

#### Tweening

Is how Flash creates an animation between two keyframes which contain objects that change size, position or colour.

#### Symbol

Is an image, animation or button that can be reused over and over again in Flash.

#### Instance

Is an 'instance' of a symbol that has been placed on the Stage or within another symbol.

#### Tell Target

Indicates you want to give an instruction to a film clip instance or to a film that was loaded using the Load Movie command.

#### Alpha

Controls the relative transparency of an object.

#### Onion skinning

Enables you to see several frames at once with all but the selected frame appearing as semi-transparent.

#### Anti aliasing

Is a way of smoothing the edges of an object or text. Flash requires more memory to play a film with anti-aliasing.

#### NEXT MONTH

Next month we will be looking at how you can use the scripting within Flash to create more complex interactivity.

# Linux

WORLD



## Your complete guide to Linux

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## How to control your menus



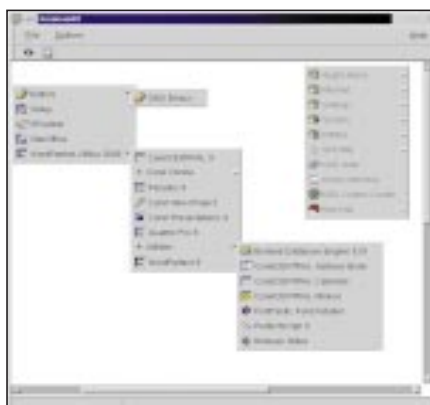
*Maurice Kelly takes the K Menu to task, before bashing out a panel*

**B**y now you should have a Linux distribution on your PC and, if you have been using KDE, you will probably have used the K Menu in order to launch some software for yourself. Most distributions make a pretty good job of packaging applications with an appropriate menu item that goes straight into the desktop menu structure. However, you may have some applications which you regularly use but which have no menu entries.

You may find yourself doing one of a number of things to get around the inconvenience. Maybe you open a terminal window from the menu or the K Panel and type in the program name. Possibly you'll right-click on the desktop, select the 'Execute command' option from the menu and type in the program name. We could suggest other options, but instead we're going to suggest a couple of ways to speed things up.

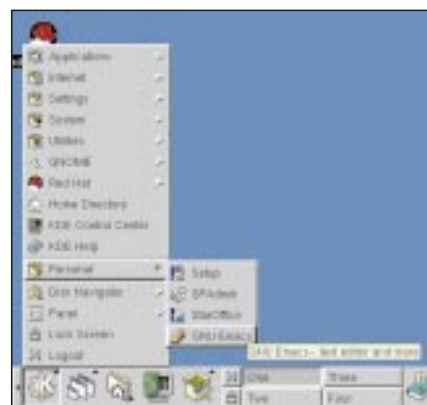
### Adding to the K Menu

Using the K Menu is instinctive for a lot of users, and it would be handy if you could get your favourite application to launch from there. Changing the menu directly requires editing the



No nasty config file editing when you've got KMenuEdit.

menu files stored within your home directory, which can be a little unwieldy for the beginner. Luckily there's an easier way to do it in the form of the KDE menu editor. It can usually be found in K->Utilities->Menu Editor. If you are using a strangely configured version of KDE that doesn't seem to have a similar entry,



Every user gets their own personal menu.

then open up a terminal window and type in 'kmenuedit'.

You'll be presented with two menus – the one to the right is the system wide menu. Unless you're running as root (which, on normal occasions, we aren't), the right-hand menu should be greyed out. This menu is for editing by 'root' only, as it determines the generic applications that all KDE users have in their menu. Fortunately, you do get to play with the menu on the left as this is your personal menu – the one that only you get to use. To create a new entry, right-click on the menu and select the New option. This opens a dialog box like the one shown in *Adding an entry*.

Once you've filled in the appropriate fields, simply click OK, and your new entry will appear

**Using the K Menu is instinctive for a lot of users, and it would be handy if you could get your favourite application to launch from there**



## CONTROL YOUR K MENU

# Adding an entry

*In order to define our menu entry we need to go through each of the major fields and fill in the details:*

### Type

This describes what sort of menu item we are creating – for our purposes we want to use the default type ‘Application’.

### File Name

This is the file name used to store your menu item. Give it a meaningful name that ends with ‘.kdelnk’ (that’s a lowercase L). We’ll call ours ‘emacs.kdelnk’.

### Name

This field is the text which appears on the menu item. We’ve chosen to use ‘GNU Emacs’.

### Icon and Mini Icon

The buttons beside these two fields should enable you to choose from a number of icons. The small icon will be displayed beside the name in the menu. The large icon is displayed on the K Panel.

### Comment

The ‘tool-tip’. If you hover the mouse pointer over your menu item this will appear giving more information.

### Execute

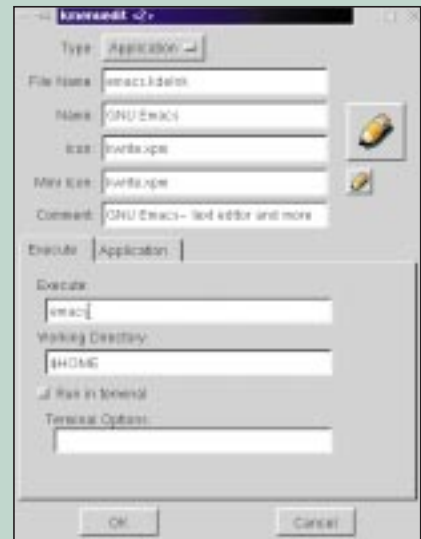
This is important as it is used to start your application. This is

usually what you would type at the command line to start the application there. You can supply extra parameters as you would at the command line. For us, Emacs is started by running ‘emacs’ at the command line.

### Working Directory

Unless you have a specific working directory to use, then you should probably insert ‘\$HOME’ here to use your home directory.

Adding a new application can sometimes seem a little bewildering.

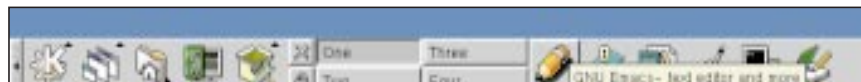


in the menu. If you want to re-arrange the menu, right-click on it and choose ‘Select item for moving’. Move the crosshair cursor to an item you wish to move, and click and hold. While holding, move the item up and down until you are happy with its new placement.

To see how the menu appears, simply press the Save icon on the toolbar, and go to K->Personal. You should see your new entry in all its glory. No more typing at the command line.

## From the Panel

While the K and Personal menus are handy, they are still several mouse clicks away. The standard K Panel contains a number of icons plus some valuable real-estate that we can claim for ourselves. To add an icon to the panel, you need to first define a menu entry using kmenuedit as described above. Once you’ve done so, open the K Menu and select the Panel



Keep your favourite applications close to hand.

item. From the resulting submenu, choose the Add Application option. This will display the original K Menu (including the personal menu). Navigate to the menu-item you wish to use as an icon on the K Panel. Clicking it will add it to the panel. If you’re not happy with the default placing of the new icon, simply right-click on it and select Move, or if you want to reconfigure it slightly, select Properties.

## System-wide menus

To change the system-wide menus you must have root access on the machine. To start kmenuedit as root, you must become root in a shell, or select it from the menu while logged into KDE as root. To become root while logged in as another user, simply open a terminal window and ‘su’ to root. To do this, type in and execute ‘su -’ and enter the

## Head to [www.linuxdoc.org](http://www.linuxdoc.org) and print off the Bash HOWTO for a spot of bathtime reading

password when prompted. Once that’s done, it’s a case of executing kmenuedit at the command line and it will appear as before, only this time the right-hand menu won’t be greyed out. You are now free to edit this menu as you did earlier with your personal menu.

We urge you take caution while doing this. What you do to this menu affects all users on the system, so bear that in mind before you decide to remove entries that don’t appeal to you.

Hopefully you have now got your menus and panel optimally configured, with all your

applications in easy reach. If you feel the need for even more convenience, you could also add items to the desktop. This should satisfy your desire to launch applications more quickly, but when KDE offers a neural link-up to enable you to launch applications by mind control, we’ll be the first to let you know.

## Command line

Occasionally, it is necessary to launch a command from the shell prompt – say, for example, you are compiling a new application from source, you will want to run the ./configure command in the source code folder, so that you can monitor the output. There are a few things you should know about command line execution to make life easier for yourself.

If you were to open a shell prompt in X and type ‘kmail’, the K E-Mail application would load, but your terminal window would remain locked up until you exited kmail. By running ‘kmail &’ instead, the shell prompt is freed up after kmail has been executed, so that you can carry on using that window as a shell prompt. It is worthwhile noting that kmail will still use that window for command line output, so you may notice messages such as ‘Return code: 552’ and ‘a SMTP error occurred’ when you are using the shell prompt for commands that don’t relate to Kmail.

If you are running a command line application and you are unable to exit it cleanly (the application may have stopped responding, for example) then you can use CTRL+C to kill the application and return you to the command prompt. If you want to ‘pause’ an application so that you can return to it later, most applications will allow you to suspend them by using CTRL+Z. You can then go off and run a series of other commands, before returning to your suspended application by typing ‘fg’ to bring the application back in to the foreground. For more information on shell prompt manipulation, head to [www.linuxdoc.org](http://www.linuxdoc.org) and print off the Bash HOWTO for a spot of bathtime reading. **PCP**

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## NEXT MONTH

Installing and compiling a new application from source code.

# Getting the most from RPM



*Installing, upgrading or removing software – we do it all the time, and many of us use the Red Hat Package Manager. Chris Jones introduces RPM's more advanced features*

**S**ince the earliest days of computing, people have needed to distribute software to other users in a form that made installing the software as simple as possible, and worked correctly on as many machines as possible. Different operating systems have different software installers, such as the widely used InstallShield on Windows. But many of them contain limitations, and most are restricted to the operating system they were designed for.

## The history of RPM

When RedHat first began producing its Linux distribution, it recognised a need for sensible package management and the features it should provide. It wrote a utility called 'RPP', allowing for simple package installation and querying and a number of other features. But it also contained some rather restrictive limitations – in particular, the program's source code had to be modified for RPP.

Red Hat contracted Rik Faith and Doug Hoffman to produce a new package management system that would be more flexible and robust – to the extent that they could base their entire distribution around it. Although the system the two produced (called PM) was never actually used directly in any products, it did form the basis of RPM, written by Marc Ewing and Erik Troan.

Initially written in Perl, RPM was easy-to-use and flexible but it was also large, slow and required Perl to be installed on a machine before it could do anything useful. Eventually



RedHat's RPM has established a clear lead as the most widely used package management system.

Red Hat rewrote the entire program in C and the RPM we know today was born.

The basic principle of RPM is that packages should contain not only an application, but also information about that application. Details of any libraries that it requires (known as 'dependencies'), a list of files to be installed, who made the package and much more is included with the RPM package. It also enables packages to be digitally signed using PGP so their authenticity can be validated. When a package is installed, all of this information is held by RPM in a special database so the information can be queried by users and also used to determine that all dependencies are met when installing new software.

## Installing with RPM

RPM has been a great success and is now used by the vast majority of Linux distributions as well as having been ported to a number of other operating systems. A list of the major distributions using RPM is given in *Who uses RPM?* (although it is not a complete list – any distribution based on RedHat will also use the RPM scheme).

Installing an RPM couldn't be simpler, the following command:

```
rpm -i file.rpm
```

will install the given RPM ('file.rpm' being the actual RPM file) checking first that any dependencies are met. Should a package fail the dependency check, a list of the required packages will be produced. Upgrading an RPM is similarly easy by using the command:

```
rpm -U file.rpm
```

It is quite common to never actually use the '-i' option because of the way '-U' works. If it detects

an older version of the package installed it will upgrade it, but if it doesn't find an older version it will install the new one. '-U' can be used on any new RPM and it will automatically determine the correct course of action.

## Uninstalling RPMs

Packages can be removed with the command:

```
rpm -e package
```

Notice, however, that 'package' refers to the name of the installed package, not a file on the hard disk or the name of the RPM. Since removing a package that others depend on would disrupt the system, RPM will produce a list of any installed packages that depend on the one you are removing. When installing, upgrading or removing packages, if you are sure the dependency warnings are either incorrect or not relevant (for example, if you have installed some software without using RPM) passing the option '--nodeps' to the RPM command will override the dependency checks.

## Finding out more

Since a normal system will have hundreds of pieces of software installed, it is unlikely that you will be able to keep track of them all, what files they have installed or where they have installed them. For this reason, RPM includes a powerful querying system. In its simplest form you can check if a package is installed with the command:

```
rpm -q package
```

From that base, a number of options can be added to obtain more information. Although most of them can be used at the same time they may not actually produce all of the information that would be obtained by running the queries individually. Adding the '-a' option will output a list of all installed packages – a useful way of identifying packages that can be removed to save space.

A list of the files belonging to that package can then be obtained by adding the '-l' option. Similarly, you can query the RPM database to find out which package owns a specific file with the command:

```
rpm -q -f /path/to/file
```

### WHICH DISTRO?

## Who uses RPM?

*Not every distribution is based on RPM...*

### Major Distributions based on RPM:

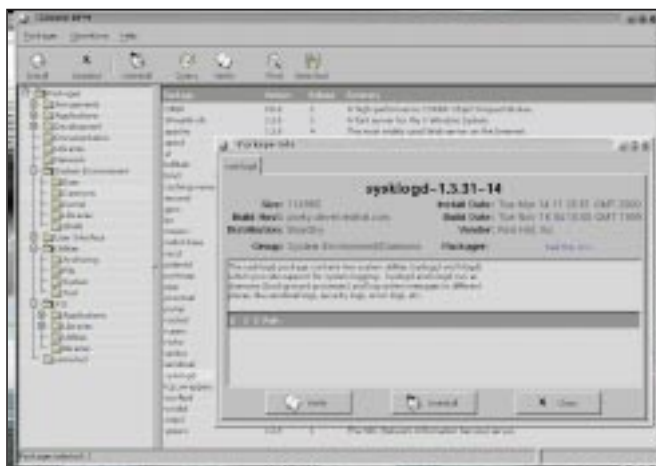
RedHat  
S.u.S.E  
Mandrake  
Caldera  
LinuxPPC  
YellowDog  
TuroLinux

### Major distributions not based on RPM:

Slackware  
Debian



It's not all complicated command line options – most RPM functions can be performed using graphical tools such as GnoRPM.



that built it, that information could easily have been faked.

For that reason, RPMs from reputable sources will be digitally signed using PGP ('Pretty Good Privacy') – one of the most widely used encryption programs on the Internet. This enables you to verify that the RPM you have downloaded was not only packaged by the vendor, but has also not been modified by someone else.

Before you can take advantage of this feature, you need to install PGP (available from [www.pgpi.org](http://www.pgpi.org)). Once you have done that, you need to obtain the 'public key' for the vendor whose software you are installing. Most of the distributions tend to include such a key on their CDs – in the case of RedHat, it is located in the root of the CD and is called RPM-PGP-KEY. Add this key to your PGP public keyring (more information on this can be found in the PGP documentation) and then verify RPMs from that vendor with the following command:

```
rpm -K file.rpm
```

you should see output similar to this:

```
file.rpm: md5 GPG OK
```

you can now tell with absolute certainty that the package is authentic and hasn't been modified since it was first built.

Not all software is available in RPM format and it is quite common for programs to be released in 'tarball' (that is, tarred and zipped as a .tar.gz) before RPMs are made available. If this is the case with some software you want to install, you may be able to create the RPMs manually from the downloaded tarball. To do this, issue the command:

```
rpm -tb file.tar.gz
```

RPM will then extract the archive to a temporary location and search for a 'spec' file (the file that describes how the RPM should work). If it finds such a file it will begin compiling the application and, when completed, will place the resulting binary RPM in one of the subdirectories in '/usr/src/redhat/RPMS/' – now just install that RPM as normal.

All of the features of RPM we've looked at here and many more (including building RPMs from scratch by writing the spec files they rely on) are covered in RedHat's Maximum RPM book. We've included it on this month's *SuperDisc* in PostScript format – view it using ghostview. The book is slightly old and isn't completely correct for the latest versions of RPM, but most of the information hasn't changed significantly. **PCP**

**chris.jones@pcpmag.co.uk**  
Discuss this article at  
[www.pcplus.co.uk/forum\\_devlinux.asp](http://www.pcplus.co.uk/forum_devlinux.asp)

#### NEXT MONTH

Chris Jones looks at setting up MySQL from scratch.

## Checking your system

Sooner or later, either accidentally or through the actions of other people, it is quite likely that something will go wrong on your system and you'll need to know exactly what it was. RPM provides a verification system that will perform a series of checks on each of the files in each package – the option '-V'. As with the querying system, this can be used on a specific file owned by a package ('-f'), on an RPM file ('-p') and on all installed packages ('-a'). If the command returns no output then you can safely assume the package is installed properly. However, if there are problems, you will see output like this:

```
SM5DLUGT c /path/to/file
```

The first part of this might appear to be gibberish, but it is actually a status indicator for the eight file properties RPM keeps track of (the list of properties is given in *RPM verification codes*). If only some of the properties are incorrect the ones that are OK will be displayed as a '.' character so a more likely output would be:

```
S.5....T c /etc/passwd
```

The 'c' character indicates that this is a configuration file and the properties show that the file has changed size ('S') and has been modified ('S' and 'T') since it was first installed. However, since this is a configuration file, it is quite likely that it will have been edited so there may not be a problem.

Any of the RPM commands can be paired with '-vv' to force RPM to display exactly what it is doing – this is often useful as some of RPM's error messages can be a little terse. For example, the command:

```
rpm -V -vv -f /bin/ls
```

will verify the installation of the 'ls' command and produce a step-by-step list of what RPM does.

## Reputable RPMs

When you download and install an RPM from the Internet you will be giving it root privileges on your system to do what it wants to. That kind of access demands that you trust the provider of the RPM not to have placed any malicious code inside the package. While the package contains information about the vendor

Adding the option '-i' will also include information about the package such as its name, version, license and a description of what the package does. Any of the queries that refer to a package rather than a file belonging to a package can also accept the option '-p' which allowed you to query an RPM file rather than an installed package. This is a good way of checking that it either contains the files you want or that its description meets your requirements.

#### WHAT IT MEANS

## RPM verification codes

The codes returned by RPM's verify option will mystify without this table

S – File has changed size  
M – File permissions have changed  
5 – MD5 checksum has changed  
D – Device minor/major numbers have changed  
L – Symlink has changed target  
U – File ownership has changed  
G – Group ownership has changed  
T – Date of last modification has changed

#### QUICK TIP

## Another package manager...

If you've found some programs that aren't available as RPMs, but you still want to make use of some of the features of RPM, epkg may do the job

**E**pkg is not as comprehensive as RPM and it doesn't work with all software, but generally speaking it is able to manage software that is distributed in tarballs.

This has the advantage that you can install and remove tarball software easily and also find out which package owns which files. epkg is available from <http://encap.cso.uiuc.edu/epkg/>



GETTING MORE FROM LINUX

# Linux Q&A

Dave Coulson takes on the problems and puzzlers of PC Plus' penguin patriots

## Fill your laptop with X

**Q** How do I get X in Mandrake to vertically fill my NEC LCD display?

Paul Hallam

**A** Assuming you've already chosen the correct horizontal and vertical frequencies in a previous X configuration attempts, we need to redefine the way in which the modes in X are displayed. The tool to do this, which comes with XFree86, is called 'xvidtune'.

Simply run it, then use the GUI tool to adjust your X display until it correctly fits the whole screen. Once you have it as you want, click 'Show' and it will display the modeline for the current mode in the terminal. You can then open /etc/XF86Config and remove the current modeline for which ever resolution you're using, before inserting the one xvidtune created for you.

## Mounting a Zip disk

**Q** My machine has an IDE ATAPI internal Zip drive, which works fine with Windows, but I am unable to mount it in Linux. The drive is recognised as /dev/hdb when Mandrake boots and is identified as /mnt/disc, but that's as far as I can go. I know enough to insert a line in /etc/fstab such as:

```
/mnt/hdb /mnt/zip auto defaults,
user 0 0
```

I still cannot mount the drive, because of an error message such as:

```
Mount point /mnt/zip does not
exist, can't find /mnt/zip in
fstab or mtab, /dev/hdb can't
read superblock, not a valid
block device.
```

I would like to mount the drive in msdos and ext2. How do I do this?

M J Dean

**A** The partition structure of a Zip disk isn't like that of a floppy disk or CD. Rather than simply mounting the device, in this case /dev/hdb, you have to mount an individual partition on the device.

You need to have it mount /dev/hdb4. The /etc/fstab line would look similar to the following;

```
/dev/hdb4 /mnt/zip auto
defaults,user 0 0
```

Which, roughly translated, means mount /dev/hdb4 as /mnt/zip, automatically picking the filesystem to use, and enable any user to mount it. If it doesn't find the filesystem automatically, or if it uses 'msdos' rather than 'vfat' (which can cause problems with Windows long filenames), there's nothing stopping you having two different mount points. Try /mnt/zip/ext2 and /mnt/zip/vfat for the same device, specifying the filesystem type for each. Simply add another line to /etc/fstab using the same /dev/hdb4 device, but change the mount point and filesystem.

## Securing LILO

**Q** I've noticed that it's pretty easy to get root on a machine, just by rebooting it then typing 'linux 1' at the LILO: prompt. Surely there is a way to stop people doing this?

Paul Linfoot

**A** Yes there is. LILO has a restricted mode where you have to type in a password in order to either pick a non-default boot item, or to add options to the end of the default one. You just need to add the following lines to /etc/lilo.conf:

```
restricted
password=secretpassword
```

As with any lilo.conf alteration, you should then run /sbin/lilo. LILO will probably tell you that the lilo.conf file is world readable, so you need to do 'chmod 600 /etc/lilo.conf' then run /sbin/lilo again. If the file holding the password is readable by every user, it's not really that much use as a security method.

## Ext2 mounting

**Q** I have a second hard disk, only about 500MB. I have formatted it to ext2 file system and it can be mounted. But only the root user can write to it and even then, the root user cannot even run anything written? What's going on?

Lee Drinkwater  
ldwater@hotmail.com

**A** I'd imagine that non-root users can't write to particular folders on the drive simply because they're owned by root and don't have permissions selected which will allow writing by others. You could either allow others to write to the directory, by 'chmod 777 /path/to/dir', or by using 'chown user /path/to/dir' to set the ownership of the

## DUELLING LIBRARIES

### Libc5 or glibc2?

*Some applications, particularly binary only commercial packages, seem to want to stick to using an older version of libc5. Ever wondered why?*

**E** ven if you've never played with libc before, it's worth knowing what it does. libc is the main C library on Unix platforms, so every C program which is compiled is linked against libc, as well as numerous other libraries which it needs to work. Each library it links to, which could be anything from X lib to MySQL, is also compiled against a particular version of libc.

For those of you who've tried to get older versions of StarOffice or WordPerfect to work properly on a recent distribution, you'll appreciate how difficult it is to get libc5 and libc6 (also known as glibc2) to cohabit the same machine. If you've got a program compiled against one version of libc and the libraries compiled against another, you get in a bit of a mess and the program will simply segfault when you try to run it.

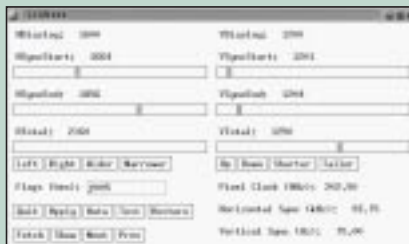
To save you having to have two copies of every library the application requires, people such as Sun or Corel compile their applications 'statically': they include the libraries they need at the cost of an incredibly huge binary. This enables you to run libc5 binaries on a libc6-based system without too much hassle, but why don't they just compile it for libc6 in the first place?

Although some distributions, such as Red Hat, have been using libc6 for a number of years, others have only started using it in the past year or so, mainly for stability reasons. The problem with producing statically linked libc6 binaries which will work on libc5 systems is that glibc2 is distributed under the GNU Public License. The license stipulates that its code can't be included in any non-GPL programs, so although you can link to it you couldn't compile a static binary of StarOffice without violating the license.

Newer versions of StarOffice and the Corel Office Suite, which incorporates WordPerfect, are dynamically compiled. This gives smaller binaries and a massively reduced memory

specified folder to that of an individual user. Again, executing items will be a permissions problem, so check whatever it was which created or installed the files to see if they should actually be executable or if they should be loaded into a different program.





Although not very aesthetically pleasing, xvidtune will help you to find tune your X configuration for your specific hardware specifications.

## Compiler problems

**Q** I've just installed Linux for the first time, choosing Mandrake 7 on May's SuperDisc.

I'm using KDE and now want to install GNU's gcc compiler. However, when configuring I get the following error message:

```
*** The command 'cc -o conftest -g
conftest.c' failed.
```

```
*** You must set the environment
variable CC to a working compiler.
```

Adam Barratt

adambarratt@contactbox.co.uk

**A** Depending which options you picked when installing Mandrake initially, you might not have gcc or the glibc-devel libraries installed.

First check config.log within the gcc source tree to see why the compilation failed. It could be because of missing headers, missing compiler or something else. If it's because it can't find 'cc', then you'll have to install the rpms of gcc before trying to build gcc. It's probably also a good idea to check that glibc-devel is installed, too. Once you've done that, you can go ahead and build gcc. You'll almost certainly want to build it with './configure --prefix=/usr', so it overwrites the RPM version of gcc, as it becomes messy having two different copies of gcc hanging around.

## Copying files to floppy

**Q** I eventually managed to install Mandrake 7.0 from your SuperDisc and dual boot with Win98, but the mouse wasn't detected. This makes navigation difficult for a new user to this OS.

I found a patch on the Linux-Mandrake site (patch.pl) using Win98: the instructions say to copy it to the Linux boot floppy. The problem is neither Win98 nor Linux itself were capable of copying the file: Linux would copy a .txt file from the Windows desktop, but wouldn't copy a .pl file saying it couldn't find a DOS file system on the floppy. Talk about Catch-22!

John Allison

sikkim@btinternet.com

**A** It looks like you'll have to copy the file using Linux and the command line. Fortunately, it's not quite as bad as it sounds. Boot

## DICING WITH DRIVES

# Partitioning your drives for Linux

*Having a single root partition in Linux may be the simplest way to go, but it's not efficient. Having multiple partitions makes everything a lot easier in the long run*



Why bother at all? If you wanted to do a totally clean reinstall, why should you lose your personal files. If you have /home separated from / you can reinstall or even install multiple Linux distributions without having to backup your /home directory or copy frequently used files over. It's also handy to be able to use different file systems, as ext2 isn't always the most appropriate case. ReiserFS, or another journaled filesystem, may be more suited to your /var or /home partition, as it handles changes to disks better than ext2 if you have to reboot without shutting down properly which makes it ideal for notebooks.

We've got a single 2GB FAT partition to start playing with. We can use either Partition Magic or one of the many free partition managers to reduce it to the 700MB partition we want. Remember to defragment the partition before resizing it. Backing up is probably a good idea, too.



With 1.3GB at our fingertips, we can begin to allocate disk space to certain parts of Linux, depending upon our usage. We can begin with our / partition, which need only be 75MB in size. Next comes our /home, where our files are stored. Depending upon the types of file you handle, this can be anywhere from 200MB upwards, just remember that all your personal preferences for applications and mail from Netscape will be stored here. /usr contains all the programs and utilities which we need, so 500MB is really a minimum if you want X and C compilation packages.

There is /tmp and /var, both of which will be reasonably empty on most home systems. /tmp can be as small as 50MB, but 100MB is preferable. If you're not using sendmail for your mail, then /var can be 50MB. We'll also be needing some swap space, too, and 64MB is probably adequate for the home user.

to reconfigure your X setup to handle the mouse properly. **PCP**

SEND 'EM IN!

## Send your questions

The best way is by e-mail: zap them off to pcplus.handson@futurenet.co.uk with Linux\_QA in the subject line. If you must burden our snailman still further, send them to: Linux Q&A, PC Plus, 30 Monmouth Street, Bath BA1 2BW, UK. We regret we cannot respond to every question sent. If you can't wait for the question to appear in print, post it on news://nntp.futurenet.com/pcplus.linux - but be sure to CC us the question as well!

# How to build a WAP-ready Web site



*The latest Internet buzzword is WAP. Simon Bisson embarks on a new series showing you how to get your Web pages on to people's mobiles*

**W**ith millions of mobile phones already in use, it's no wonder that over £22 billion pounds was raised by the recent auction of third generation mobile phone licences. Promising 2Mbps connections, the next generation of mobile phones is going to change the way we see the Internet.

You don't need to wait that long to see the mobile Internet, as the first few WAP (Wireless Applications Protocol) phones have started to appear – phones that will at least enable you to use some Web services wherever you are...

## Creating WAP pages

So how can you create your own pages for WAP phones? WAP is an important step on the route to an always-accessible Internet applications framework, enabling mobile phones to access simple text and form-based Web applications.

Working with WAP pages is similar to working with traditional Web architectures. A WAP Gateway acts as an interface between the TCP/IP world and the mobile phone, translating information and passing it to and from the phone. One thing to remember with WAP is that you don't use HTML, which is designed for use on large screens. Instead, WAP uses a mark up language of its own: the Wireless Mark-up Language (WML). You'll find all the details of WAP 1.2, the current version of the WAP standard, on the WAP Forum's excellent Web site: [www.wapforum.org](http://www.wapforum.org).

If you're used to working with HTML, you'll find some aspects of WML familiar, while others



The Nokia WAP Toolkit is one of the most popular WAP development environments. You can use it to edit and test your WML code. It'll even simulate a WAP Gateway to make your applications run correctly.

are very different indeed. WML is defined as an XML DTD (Document Type Definition), so it requires more care in implementation than a piece of HTML code. You will need to be sure that the tags you're using are correctly terminated otherwise a WML browser will fail to parse and display your page.

## WAP browsers

The WML browsers in WAP phones are known as 'micro browsers', and you'll need to be careful how you design content that will be delivered by WAP. The first generation of WAP phones, like the Nokia 7110 or the Motorola P7389, have displays can only show 3 or 4 lines of text at a time. You must take this account when you're designing WML pages.



It's a good idea to use as many different WAP development toolkits as possible – as every phone behaves differently. Here we're using our test file in a simulated Motorola P7389.

You'll find micro-browsers generally limited – and thanks to their integration with the standard mobile phone handset, also difficult to design for. What works in a Nokia phone can't be guaranteed to work in a Motorola or Ericsson.

## A deck of cards

To make things easier, every WML page is divided into 'cards', each of which is displayed as a separate entity by the WML browser. This deck of cards approach requires you to explicitly add navigation instructions to your cards, so that users will be able to access the information you're delivering to their phones. You can use <a href> style links, which aren't understood by every phone, or by using WML's <do> and <go> tags, which work with a phone's built-in menu system.

### THE NEXT GENERATION

## iMode – Japan shows the way to the future

*In Japan the mobile Internet is using HTML and colour displays...*

**W**hile the western world has standardised WAP and WML as the key technologies for mobile Internet services, they are limited by the low speeds of the current GSM data network. In these days of ADSL and cable modems, 9,600 bits per second is somewhat slow...

Over the next few months the main GSM network operators in the UK will be rolling out the General Packet Radio Service (GPRS) services. The GPRS is a different way of delivering mobile data, as it is equivalent to an always-on ISDN connection. The next generation of the WAP standard, WAP 1.2, is likely to add new services

designed to support these higher bandwidth connections. But what type of applications will we see?

One pointer could be NTT DoCoMo's wireless Internet service iMode. This is a 22Kbps packet radio service running in Japan's main cities. Its low prices have attracted a lot of subscribers, and it uses a compact version of HTML to deliver applications to phones.

C-HTML is easy to use and it's very easy to convert existing Web sites to run in iMode phones. With most of the main Japanese consumer electronics companies producing iMode phones,

they're becoming cheaper and more sophisticated – with the latest offering colour displays. Games and chat are the most popular services on iMode, with some phones downloading new Tamagotchi or Pokémon-style characters for a small fee. You can also shop on-line, or access your bank details.

Next year will see the British Isles' first 3G trials in the Isle of Man. BT Cellnet has partnered with NTT DoCoMo to see how the iMode experience can be brought to the next generation of mobile phones.

You can find out more about iMode at [www.nttdocomo.com/](http://www.nttdocomo.com/).

Every card has an ID and a name. The ID is used to handle navigation between the cards in the deck. The simple deck shown below has a single card, which will display a line of text in a phone's screen.

```
<wml>
  <card id="card1" title="PCplus">
    <p>
      Hello from the PC Plus Web
      Workshop.
    </p>
  </card>
</wml>
```

Using the following snippet of code, you can use a phone's keys to move from one card in a deck to another. A label displayed on the phone menu as 'Next' will enable a user to move from one card to another in a deck.

```
<do type="accept" label="Next">
  <go href="#card2"/>
</do>
```

One thing to notice about WML is that the <go> statement in this block has to be explicitly terminated by a trailing slash – otherwise it will cause an error, and won't be displayed. You also have to make sure that you only use lower case for your WML tags, otherwise they won't be recognised by XML parsers. It's also good form to only use lower-case for your HTML tags, as the next release of HTML will be XHTML 1.0, which applies XML rules to HTML.

See the *Code corner* for a more complex piece of WML code. It is a four-card deck that takes user input and then displays it on the phone's screen. It might seem fairly simple by normal HTML standards, but it gives you a good idea of most of the main WML functions.

All the text blocks are surrounded by <p>...</p> tags and the document has an XML document type, so that it can be validated against the official WML specification. You'll need to include this block at the start of every WML document you create for it to be handled by most WAP gateways:

```
<?xml version="1.0"?>
<!DOCTYPE wml PUBLIC "
//WAPFORUM//DTD WML 1.1//EN"
"http://www.wapforum.org/DTD/wml_1.1.xml">
```

The DOCTYPE section includes the URL of the official WML XML definition document.

Our example uses two cards to take inputs. These use the two most common WML input statements, the <select> block and an <input> statement. The <select> block is just the same as a standard HTML form select statement, and behaves much the same way. You'll need to give it a title, as it's usually displayed in its own screen by most WAP browsers.

```
<select name="word" value="Hello"
title="Word">
  <option value="Hello"> Hello
</option>
```

```
<option value="Goodbye"> Goodbye
</option>
</select>
```

One difference from HTML is that you can access the resulting value and display it in the rest of the cards of a deck, before submitting back to a Web server for processing just like a standard form. The 'name' of a select block is used to hold the resulting value, and it can be displayed by prefixing it with a \$. In our example, card 4 displays both the values of the select block and the input statement.

Select blocks are the best way of creating interactive WML applications. You can use them to provide a WAP site's users with pre-configured choices, rather than expecting them to use the phone to type in values.

One of the difficulties with a phone's simple keyboard is that it can take up to 4 key presses just to enter a letter. If a free form input is needed, you can use the input tag to control a user's inputs using an input mask. This can limit the types of characters they are allowed to input, or can force a specific length. You'll find this also useful if you're using the input tag to input a password – which if you choose the passport type, will be concealed rather than displayed. It's also possible to group the various types of input element, enabling you to create complex applications that behave more like HTML forms.

## Get a toolkit

If you want to know more about WML, download the Nokia WAP Toolkit from [www.nokia.com](http://www.nokia.com). Not only does it come with plenty of documentation on WML in PDF format, it also includes a set of simulators that enable you to test your pages. These include the popular 7110, as well as two of their latest phones: the 6110 and 6150.

Nokia isn't the only company with WAP phones and simulators. Motorola has one, as does Ericsson. Most of these companies will ask you to sign up to their free developers programmes, which are well worth using. They provide support and plenty of information you won't find elsewhere – there were only two books on WAP available at Amazon when this article was written...

Of course, if you want to have something more generic, you can use the tools provided by the originators of the WAP standard: **Phone.com**. You'll also find that soon most of the commonly available Web design tools will support WML. Already HomeSite will handle WML documents, and Macromedia are working with Nokia to add support to Dreamweaver.

## Upload your pages

Once you've created (and tested) your first WML pages, upload them to your Web space – making sure you use the WML extension for all your pages. You'll also need to check that your ISP has configured its Web servers to use the correct MIME-type for WML decks (text/vnd.wap.wml), so they're handled correctly by the WAP gateways. Then all you need is a WAP phone to see if you can access your Web pages on the move... **PCP**

## CODE CORNER

# Your first WAP page

*WML won't be too unfamiliar to anyone used to HTML. Just remember, it's a lot stricter*

```
<?xml version="1.0"?>
<!DOCTYPE wml PUBLIC "
//WAPFORUM//DTD WML 1.1//EN"
"http://www.wapforum.org/DTD/wml_1.1.xml">
<wml>
  <card
    id="card1" title="PCplus">
    <do
      type="accept" label="Next">
        <go href="#card2"/>
      </do>
    <p>
      This is a test WML deck
      for PC Plus.
    </p>
  </card>
  <card id="card2" title="Pick
    List">
    <do
      type="accept" label="Next">
        <go href="#card3"/>
      </do>
    <p>
      Please choose a word:
    <br/>
    <select name="word"
      value="Hello" title="Word">
      <option
        value="Hello"> Hello</option>
      <option
        value="Goodbye"> Goodbye</option>
      </select>
    </p>
  </card>
  <card id="card3"
    title="Name">
    <do type="accept"
      label="Next">
      <go href="#card4"/>
    </do>
    <p>
      Please enter your name:
    <br/>
    <input type="text"
      format="M" name="NAME"
      title="Name:" />
    </p>
  </card>
  <card id="card4"
    title="Display">
    <p>
      $word
      $NAME
    </p>
  </card>
</wml>
```

**Simon Bisson**

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## NEXT MONTH

How to create more complex WML decks, using WAP's built-in scripting language WMLScript.



# How dynamic is dynamic?



Can Netscape's new layout engine finally support the Document Object Model, or is it still all on paper?



SEE OUR **SUPERDISC**  
PATH: \handson\files\dhtml

**O**ver the past three years, many Web authors have become frustrated with the two main browser vendors disagreement on Dynamic HTML – extensions to the HTML language which were added to both browsers at version 4, in 1997. The problem since then has been that the two browsers, Microsoft Internet Explorer and Netscape Navigator, support different types of DHTML, so pages written with code for the IE extensions would not work in Navigator and, in most cases, vice versa.

However, while Netscape has been enhancing Communicator, Mozilla.org has been writing a new layout engine for Navigator which will enable it to properly render pages designed for Internet Explorer. Netscape has adopted this layout engine, added a few of its own features and packaged it off as Netscape 6 Preview 1 (still in beta form at the time of writing this article) – available on this month's *SuperDisc*. In order to test whether or not the two browsers have finally become more compatible, we wrote and tested some pages containing code which would previously only have worked in IE. There were some surprising results...

## Absolute positioning

In basic HTML, images and other objects could only be in flowing text – their position was relative to the other text and objects around

them. It could be set to a limited extent, by using justification, but anything beyond that was impossible. With the advent of DHTML, objects could be positioned at any pair of co-ordinates within the browser window. This effect could be achieved in both Netscape and IE, but with one major difference: IE allowed the absolute positioning of any object, whilst Netscape limited this to only a select number of container tags (such as `<span>`). Unfortunately, amongst one of these non-supported tags is `<img>`; probably one of the most commonly used!

By version 4.7, Netscape had yet to include this feature, and an absolutely positioned image (outside a container) was simply put in the position of its tag in the code. Fortunately, this is one of the areas where Netscape 6 Preview 1 has greatly improved, rendering our *PC Plus* image in the correct position on the page. Well done Netscape! The file is available on the *SuperDisc* for you to see for yourself.

## Collapsible menus

These menus provide a useful, if not invaluable, index/menu system especially where a lot of categorised items are used. To see how to write these amazing systems, check out Paul Stephens' article in *PC Plus* Issue 137 (March 1998). The failure of Netscape 4 in this case is as a result of it not enabling the scripting of `<span>` tags. It

realises that the menu sections should be hidden, and does so. However, its DOM does not go so far as to recognise the spans as named objects and allow the 'onClick' event on them, and therefore will not open them out. This problem continues through to Netscape 6 Preview 1 – hopefully to be sorted by the next release. Again, the demo of this feature is on the *SuperDisc*.

## Nested tables

Due to a 'random feature' of IE5 (not IE4), the backgrounds of tables two or more layers deep are periodically not displayed correctly. This is not only in the standalone browser, but also in embedded versions such as AOL. Luckily, this has always been fine in Netscape (since version 4), provided there is at least one character (even an `&nbsp;`) in each cell – Netscape 6 Preview 1 is no exception. Check this out for yourself in our *Table stress test*. Note that we found this bug to be very intermittent and, generally, only rears its head when opening Web pages from a Web server, rather than from the local hard disk. Another interesting result is that the backgrounds sometimes re-appear after a delay. Interesting, and hopefully gone by the time IE6 is released...

## Speed and style

Without commenting in great depth, as it is still in beta stage, Netscape 6 Preview

The *Hollyoaks* page as displayed in Internet Explorer. The buttons seem to have a problem, due to a 'Random Feature' of IE displaying Table backgrounds correctly.



The same page viewed in Dreamweaver, the program it was created with. It displays the background colour in the second-down left-hand cell fine.





## KEY DIFFERENCES

## MS and Netscape – grounds of conflict

*We know that MS and Netscape can't agree on a DHTML standard – both browsers claim to be standards-compliant, but what are the real differences?*

**I**n 1997, the key difference between the two versions of Dynamic HTML which were supported by the major browser vendors was the difference in how the document object models (DOM) were implemented.

Microsoft's version essentially made every tag a scriptable object, enabling developers to access properties and events in order to change the appearance and content of documents without having to reload pages from the server. Netscape's version is based on a similar principle: Rather than exposing every type of tag as a scriptable object, as in Internet Explorer, it chose to only support scripting on selected tags. This was annoying to say the least, and it prevented many Web authors from using DHTML for what it is best at – animation and content presentation enhancement. With a little bit of practice, and an understanding of either JavaScript or VBScript, you could write Web applications and interactive features for your site that didn't require special Web server support, so you could use it with your free space.

Things such as games, interactive features, forms that did something and all manner of other things were suddenly available to Web developers all over the world who used IE and Netscape. But, due to the huge differences, most of the developers just stuck to the lowest common denominator, which was using Netscape's standards. But then, scripts using <LAYER> tags still wouldn't work in Internet Explorer, developers just left their pages as static. Most developers, even with today's high browser standards as set by the W3C, still stick to non-dynamic pages. The problem is that pages do not to take advantage of today's browsers because they are developed around what browsers could do two years ago.

Netscape 6 is an extremely powerful browser, packed to bursting point with great features that, when matured, will enhance browsing for Netscape users immensely. Netscape needs to gain back the market share which Internet Explorer has undeniably stolen from them. Netscape 6, when complete, will be capable of doing this if Netscape works at getting all of the official standards supported and at least some of Microsoft's extensions, such as data persistence. For many of Netscape's dedicated users, who have stuck with Netscape over the period of market share loss, the interface improvements will be enough to give them reason for moving across to

Netscape 6. But for people who have moved over to Internet Explorer, the interface improvements will probably not be enough. Netscape really needs to get complete standards support before it has much of a chance in the browser market.

For users running operating systems other than Windows, there is not really a lot of choice, Netscape is the browser which you have to use, as there aren't many others which will come near rendering today's Web sites properly. But for Windows users, who are in the majority, Internet Explorer versus Netscape could go on for a long time.

If Netscape gets support for all Microsoft's standards, then the pressure will be on Microsoft not to restart the whole fiasco by adding a load of new DHTML features that Netscape will not support until the next release. But until Netscape gets that support laid down, there really isn't any pressure on Microsoft, and it will pull so far ahead that standards from the W3C will become unimportant.

The new layout engine, which has been developed by the open source site at [www.mozilla.org](http://www.mozilla.org), has improved the state of Netscape's Dynamic HTML immensely as you can see by the tests. However, there is still a lot of work to be done such as the onClick event which a <span> (or a <div>) should support still doesn't work preventing, for instance, my Dynamic HTML-powered poker game (available at [www.eggrareus.co.uk](http://www.eggrareus.co.uk)) from working correctly. It would be easy enough to substitute hyperlinks for the spans to enable loading of other pages as opposed to the window.navigate command which has been used in various JavaScript functions, but this would not allow calling of scripts because it does not support an onClick event on a hyperlink either. Admittedly this is still a preview and the final release may address these problems.

Overall, then, even though the layout engine has improved significantly upon that of Netscape 4 it still needs general optimisation and debugging before it will be perfect. That is, however, the point of Beta code, so don't judge Netscape just yet – it will improve. We will be covering Netscape 6 throughout its beta stages and through to the release. Watch this space!

## USEFUL ADDRESSES

## More on the Web...

*If you want to do some more research into Netscape 6 and its layout engine, here are the sites you need*

- [www.netscape.com](http://www.netscape.com) – The official home of Netscape and Navigator. This will take you to the Netcenter portal.
- [www.mozilla.org](http://www.mozilla.org) – The group responsible for the latest Netscape layout engine. The source code is downloadable from here.
- [www.microsoft.com](http://www.microsoft.com) – Get information on coding DHTML for IE, and it is

also possible to download the product itself from this Web site.

- [www.webmonkey.com](http://www.webmonkey.com) – Contains loads of great info about Navigator 6, and its compatibility with both IE and earlier versions of Netscape.
- [www.w3c.org](http://www.w3c.org) – The Internet standards organisation which specifies the DOM standard, as well as other HTML specifications.

1's speed, or lack of it, needs something of a mention.

Rather than the standard Windows interface, Netscape 6's interface resembles a Web-based application, and with it comes the speed of such a utility. On our test machine – a P233 MMX with 32MB of RAM – we spent rather too long waiting for it to appear after being in the background and we experienced very annoying five second plus delays after clicking on menus. Obviously on faster machines this will be reduced, but there are still many less than state-of-the-art computers in use, and compared with the near-instant response times of IE5, this needs some significant work on Netscape's part – although the removal of debug code should help.

On the plus side this rather different interface enables almost total browser customisation via

skins. Although possible uses do not immediately flood to mind, this could be a useful feature for, say, Internet cafés to be able to plaster their logo over the computers people use. Another, rather less desirable, application would be for Free ISPs to not-so-tactfully remind their customers who they are with. Title bars and logos are just about bearable, but whole browsers... arggh!

### Summary

So, what do we think of Netscape 6 Preview 1? Well, in some ways it has definitely improved on version 4 but so far the interface leaves something to be desired. Hopefully the removal of beta code and general optimisation should speed things up, giving a great opportunity for customisation. However, there is still work to be done on the layout engine to get it up to IE's standards.

For those of you who are interested, it is possible to speed up development of Netscape 6 by downloading it from [www.netscape.com](http://www.netscape.com) and testing it. If you find any bugs, you can report them using the tool at [www.mozilla.org](http://www.mozilla.org).

Over the years, Netscape has got itself into something of a compatibility hole, and maybe at last has realised that now is a good time to stop digging. **PCP**

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[robert@eximius.co.uk](mailto:robert@eximius.co.uk)

### NEXT MONTH

We introduce the pick of the free Net-aware software available today.

# Setting up Internet Information Services 5.0



*Reliable Web serving has traditionally been Microsoft's Achilles heel. But, with Windows 2000, that's all changed*

**I**nternet Information Services (IIS) 5.0 is the built-in Web server in Windows 2000 Server. It actually looks after just about everything to do with IP in Win2000. As Windows evolves into an increasingly Web friendly operating system (no matter what the US Department of Justice says), so IIS 5.0 interweaves itself with each Win2000 Server feature.

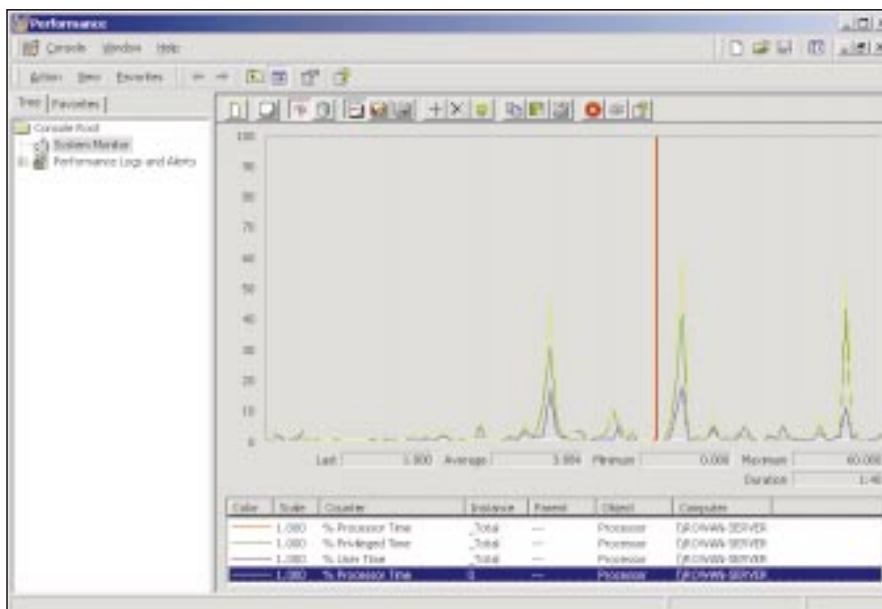
In this month's tutorial we show you how to build and serve an Internet and Intranet site (distributing Internet, e-mail and FTP to network clients) and look at ASP and VPNs on the way.

The first thing we have to say though, (here comes the disclaimer...) is IIS 5.0 is big. We could print a few books on all the things it does (see *Windows 2000 Server Resource Kit*), so we'll leave the really advanced stuff like IP/X routing for a later date.

Microsoft has spent a lot of time during the development of Win2000 improving Internet Information Services because of criticism from the Internet community of version 4.0. The main areas of improvement are the security, programmability and administration of the service.

IIS 5.0 is fully integrated with Active Directory, which makes building Intranet and Extranet functionality into your network far easier than in previous versions. An important trend in all levels of IIS, which has clearly been noted by Microsoft, is the integration of business systems, particularly between supply chain management or ERP and Internet technologies. IIS 5.0 is perfectly placed to take full advantage of this. Out of the box, it

**You can build a Web site with static or dynamic pages, distribute Internet access, e-mail or FTP to network clients and even use IIS to drive your e-business**



**It's vital to monitor the performance of your IIS server to ensure maximum reliability and speed – performance monitor is a good basic tool for this.**

integrates perfectly with what will, no doubt, become the industry standard Directory system, Active Directory, and also makes use of a huge variety of data sources and protocols.

IIS 5.0 is also extensible. Standard Microsoft tools can be used to extend the capabilities of IIS 5.0 to any custom level of functionality, though a fairly high level of programming skill will be required to do the job effectively.

IIS 5.0 is a service within Win2000 Server. It is managed through the MMC (Microsoft Management Console) and shares privileges, information, security rules, models and a common administrative format with other services in Win2000.

## How does it work?

IIS 5.0 supports a number of functions, including the integration of Internet connection sharing. It can be used to distribute e-mail, ftp, news, Internet, print, media and communication services to network clients; or it can be utilised as a fully-functioned Web server on an Intranet, Extranet or the Internet.

The service is installed during setup (or later if you choose not to install it) and automatically connects itself to the security

policy databases, such as users and groups in the Active Directory.

It's feature rich and wonderfully flexible. Competitors such as Apache may offer a trendier name, but it isn't as fast on Win2000 and cannot offer nearly the level of integration that IIS 5.0 achieves out of the box.

## Improving the way you work

The Internet is playing an increasingly important part in business. Even if it doesn't mean e-commerce or Web connections, Internet technology greatly reduces the cost of turning a paper-based business into an e-business.

You can use Internet technology to greatly reduce operating costs in a number of ways, through an Intranet or Extranet. To really utilise the power of the offering, you need to look at applications and how they can be used to improve the way you work. Look at the business from end to end and identify bottlenecks and poorly designed processes.

Once you have examined your business, you can think about what IIS 5.0 can do for you. Many businesses just aren't suited to trading over the Web, but could easily benefit from



cache data in memory, so it is then stored in virtual memory on a hard disk, slowing performance significantly.

Win2000 Server largely tunes its memory automatically, but you can adjust the amount of virtual memory available and cache sizes to fit your system. IIS 5.0 uses about 2.5MB for the core code, plus about 10KB per connection, though caching will significantly add to that figure.

You can improve your memory usage and overall site performance in a number of ways. For example, by keeping files on the same logical partitions of regularly defragmented disks, the file system cache will be more efficient. You can also mirror disks to improve performance which also provides redundancy for the system.

CGI applications take up a lot more processor time and memory than ASP equivalents in IIS 5.0. Converting your CGI will boost performance.

Track down processor bottlenecks with the Performance Monitor tool (Administrative Tools/Performance). In the processor group

select the Processor Time field (the total use on each processor) along with the Privileged time (time spent when code has direct access to hardware), User time (time spent in user mode – IIS 5.0 runs in user mode) and the Processor queue length fields.

If you look at a histogram of the results and find large queues from when processors are busy, there is likely to be a bottleneck. To combat this, you can either add processors (or upgrade the L2 cache on the processor), or use Process Throttling to reduce the CPU time of other applications.

## Adding Dynamics

Web applications give your Web site a level of interactivity not possible with static pages, and are often what makes a site productive. IIS 5.0 has been improved radically in its handling of Web applications. While it's still geared towards ASP applications, it's a great improvement over IIS 4.0.

IIS 5.0 now supports the majority of data standards, as well as Shockwave, DHTML,

ActiveX and pretty much any other standards you can think of. Applications are generally best built with an application development environment like Macromedia Drumbeat 2000 (soon to be Dreamweaver Ultradev) or Allaire ColdFusion 4.5. The Macromedia software works with IIS 5.0 to create ASP applications based on your databases and scripts generated by Drumbeat. It's the easiest – and possibly the quickest – way to add dynamics to a site.

## Security

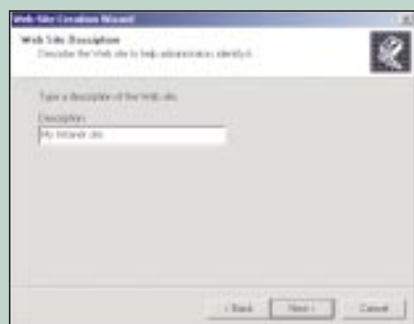
You can set the security permissions for each site, virtual directory and file with IIS 5.0 and the type of authentication required to access it. Most of the standard cryptography and authentication standards are now supported, and LDAP (the standard directory system) is used as the basis of Active Directory.

Security set up will depend on the audience of the site. While security may be less important with an Intranet, it's vital for a Web site. One of the major advances is Security Certificates,

### GETTING STARTED WITH IIS 5.0

## Build a Web site from scratch

*The procedure for creating and configuring an Internet or Intranet site is identical; it's the permissions and availability configuration that are different*



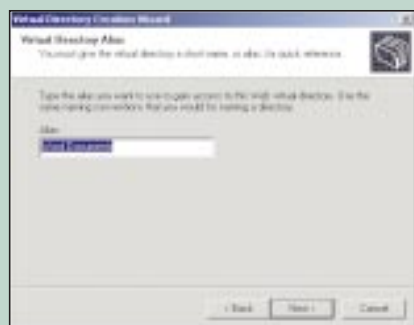
**1** Open the Internet Services Manager, select your server and press Action, New and Web Site. Within the Add New Site Wizard give the site a title – if it's a Web site your building, the URL makes up a good name. Then enter the IP address and TCP port it will use.



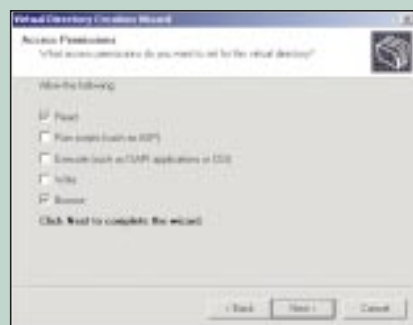
**2** Set the access permissions for the home directory – they'll depend on its audience and sensitivity. Static pages only need read access, but applications must have run and execute permissions.



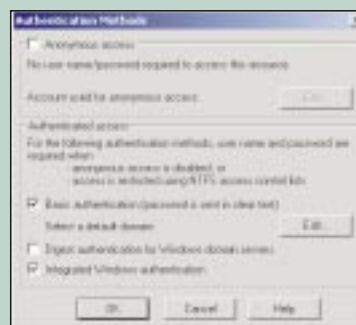
**3** Then set the location of the home directory. By default this will be C:\inetpub\WWWRoot, but you can change it to anything you want. You can also specify whether the site will enable anonymous access. Click Next and the wizard will finish.



**4** On this new site, you can now add Virtual Directories that mirror content found in other places on the network. Right-click you're new Web site, point to new and Virtual Directory.



**5** Follow the wizard through selecting the directory you wish to distribute and the permissions allocated to it. As with your home directory, the permissions you set will depend on the type of content the Virtual Directory contains.



**6** Permissions can be set in other places. Open your site Properties, choose the Directory Security tab and press the Anonymous access and Authentication control button to choose a login method. You can also use the Local Security Policy to create rules for login universally, or specifically to IIS.



## ALL ON-LINE

# Distributing Internet

*Sharing your Internet connection, be it dial-up or leased line, is a three-click operation*

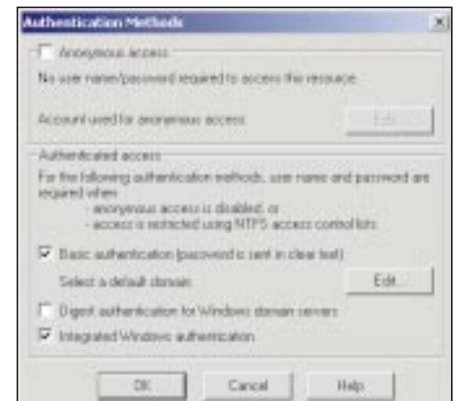
**I**nternet connection sharing is simple and involves little more than right-clicking on your chosen connection from the server (in Network and Dial-up Connections), choosing Properties, press the Sharing tab, then the Share This Connection box. This will distribute the connection to network clients.

At that point you also have the choice to add SMTP, FTP, Telnet and other services, although it's easier to distribute Mail and News via IIS. Before continuing, make sure you set the security settings by using the Security tab.



Sharing Internet connections is easy and can be done from any machine on the network, it just needs a static IP address.

You need to set what type of users can view each site, directory or file. This can be from anonymous users to permissions integrated with Active Directory.



which require SSL, but work in a similar way to SecureID tokens as key based passes.

The level of security you decide on will ultimately rest on the financial value of your content. If you are using e-commerce, then security will be paramount, whereas a static page site with basic information will require no more than anonymous access.

The easiest way to set basic security permissions based on standard Windows security is to use the permissions set on each file, site and virtual directory. For example, denying write privileges will prevent damage being done to files.

## Intranet

The integration with Active Directory achieved in IIS 5.0 and Win2000 simplifies building the blocks for an Intranet. It needs little more than the skills we outlined in our earlier article on building the Active Directory and a security user group that becomes an Intranet resource and privileges centre.

To build a basic Intranet, follow the instructions we've outlined on creating a Web site, but ensure that permissions are

only for internal clients and that the site is published on the TCP/IP network as opposed to the Internet.

You may be thinking that once you've built a client/server network and distributed files using Win2000 Distributed File System and the Active Directory, there's little point bothering with an Intranet. In some ways you'd be right, and there must always be a justification for its existence. But what happens if you introduce a couple of Windows Pocket PC devices into the system, or want to view information while with a customer? While you can still do this through remote access, it can be a little slow. A much more efficient solution is to publish files on an Intranet through IIS 5.0.

The most important part of building an Intranet is planning the content. Keep the purpose of your content in mind and an Intranet will have a good chance of success. WebDAV is a good choice for an Intranet as it allows collaborative working and version control on documents. See *WebDAV – collaboration made easy*.

The most important part of the Intranet setup process is to ensure that privileges are correct. This is achieved through the Properties

box of the Web site in question. As it is integrated with Active Directory, it's little more than a case of choosing Users and Groups with specific privileges.

It's also important to note that IIS 5.0 also enables you to extend print, communication and media services, as well as file services, on to the Web. First you need to install Server Extensions (right-click the Web site, point to All Tasks and select Configure Server Extensions) and then choose Options and configure the extra services that you require.

## Streamlined business

The success of your business may depend not only on a Web site, but also on introducing Web functionality into your existing business processes. Through Web applications, you can cost-effectively streamline mission critical business processes while also improving your service to customers.

With Internet Information Services 5.0 and Win2000 this is now a great deal easier to achieve. Thanks to interplay between IIS 5.0 and Active Directory, creating an Intranet involves little more than basic skills in managing Active Directory, building Web pages and applications.

While the technology is simple, you must keep in mind that it is only ever a facilitator. Many will, doubtless, get carried away by the simplicity of it all and forget exactly why they need it – it is there to improve your business and to create competitive advantages through improved delivery of information and applications. If you stick to your business goals and design a system around their achievement, then it's difficult to produce a system that isn't designed for purpose. **PCP**

**Peter Guthrie**  
peter.guthrie@pcpmag.co.uk

## COLLABORATION

# WebDAV – collaboration made easy

*Get your workforce collaborating on documents from anywhere in the world*

**I**S is a great way of publishing documents to internal or external clients, and working collaboratively has been a goal of many organisations for a while but the software to help them do it has been prohibitively expensive. The problem is version control: it ends up with a document being called 'bid-looked at by x and x and x 6-1-00.doc' and confusion over which is the latest version soon exists.

IIS 5.0 now has full support for webDAV or Web Distributed Authoring and Versioning. By creating a webDAV directory on the Web server, you can easily let users share documents over the Intranet, Extranet or even Internet. You can use the authentication standard in Windows (even active directory) to gain information on privileges and groupings. Remote file users can move,

edit or even delete files without full filesystem access to the server.

It's especially useful when your workforce is based in a number of locations. When a sales person is with a customer and needs to get the latest version of a price list, it can simply be lifted from the Web, Intranet or Extranet with little more power required on the client machine than a Web browser.

## NEXT MONTH

We take a break from Windows 2000 to introduce a new subject.

# Help Screen



Seven pages packed with tips, advice and your PC problems solved by our resident expert Ian Sharpe. Find out how to contact him below

**W**e're here to help! On these pages we'll do our best to offer help and tips on Windows, Linux, hardware, applications or anything else likely to be useful to other readers. We're also happy to receive further ideas about questions already published. (Installation problems with the *SuperDisc* are only dealt with via the support desk whose contact details are listed at the front of the magazine, although *Help Screen* is of course open to questions about using the apps featured on the *SuperDisc*.)

When writing in, please include as much relevant information as you can. If you have a software problem, be sure to say which version of the application you are using. With hardware, please be specific about the make and model. In all cases, specify the hardware and operating system version you use.

It is only possible to reply through these pages and we regret that we cannot give technical advice on a personal basis. But don't let that stop you – get writing and we'll do our best.

## WRITE IN! HERE'S HOW:

**Help Screen, PC Plus,  
30 Monmouth Street,  
Bath BA1 2BW.**

**Alternatively, e-mail:  
lan.sharpe@futurenet.co.uk  
or fax:  
01225 732295**

**Ian Sharpe**



## USB

### Should I buy a hub?

**Q** I need a new keyboard and fancy a Microsoft Internet Keyboard Pro because it has two USB ports. This would be useful because I already have a USB camera and a scanner, and I am planning to buy a USB colour printer. The keyboard would occupy one of the PC's USB ports, and the printer or scanner would take the other. The remaining devices would plug into the keyboard.

Do you think the extra cost of the Pro version of the MS keyboard is worth it, or would I be better off with a standard keyboard and a separate hub?

**Jon Denton**

**A** I haven't used the Pro version, but the standard MS Internet keyboard has a nice feel to it. At the time of writing the best price I can find for it is £18 including VAT and postage from [www.dabs.com](http://www.dabs.com), and for that money I reckon it's a good buy. Keyboards in this price range often feel flimsy and vague but Microsoft's is just inside the quality zone.

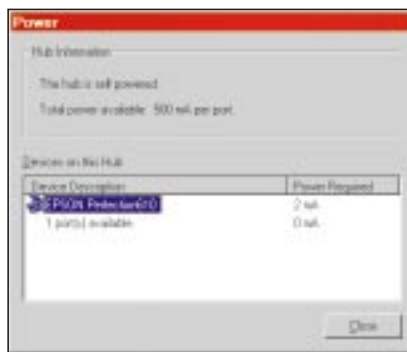
The Pro version has two USB ports, 19 additional hotkeys for Internet navigation and multimedia controls, and I found it at £34 from another source. The standard version has no USB ports and ten additional keys – the multimedia ones are missing.

One of the cheaper four-port hubs such as the Xircom PortGear at £34 or the Busby at £28

would take your spend to between £46 and £52. The extra money buys two more free USB ports. This cost per port is comparable with the Pro keyboard but you're losing nine of the extra hotkeys.

Fairly even then, and a matter of preference? Not quite. Even if you don't mind having the USB cable for your scanner or printer attached to the keyboard, a separate hub should have an independent power supply (double-check before you buy). This enables it to supply 500mA per port. USB devices with their own power supplies won't draw anything like that, but the USB specification does allow a device to take all its power from the USB port.

The MS keyboard is a bus-powered device so its pass-through ports are limited to 100mA.



This scanner is powered from the mains so only takes 2mA from the USB port. Some devices take a lot more, and cannot be plugged into any old free socket.

This is okay for self-powered devices, or bus-powered ones with low power requirements such as mice and joysticks. It could be a snag if a bus-powered device has high consumption.

Printers are normally self-powered, but does your camera or scanner take power from the USB? The scanner will be obvious, but for other devices such as a camera you can check in System Properties. Attach the camera and on the Device Manager tab double-click 'Universal Serial Bus controllers'. Double-click 'USB Root Hub'. On the Power tab click the Power Properties button. You should see a list of attached USB devices and their power consumption. If it's taking 100mA or more you couldn't plug it into the MS keyboard.

Another advantage of having a separate hub is that if it or the keyboard develops a fault outside the warranty period, it's going to cost less to replace. The separate solution isn't so neat, you don't get so many hot keys, but you do get more freedom to expand.

If you are going to be typing for extended periods, see if you can try a prospective keyboard in a shop. Whether or not it feels good is largely a matter of taste.

## Linux

### Uprooting Mandrake

**Q** I wanted to know what all this Linux stuff is about so I loaded Mandrake from the May 2000 *SuperDisc*. This seemed to go okay apart from the partitioning bit which needed a number for



creating a partition. I reduced the figure from 3.5GB (the capacity of my hard disk) to 2.5GB and went from there. The rest worked and I was soon playing about on the Linux desktop.

After a while I decided to uninstall Linux. I couldn't find any way to uninstall it, so I did what I've done a few times before when my system developed too many problems – I formatted the hard disk (I keep all my data on another physical drive).

I became a bit worried when the format program only formatted 1GB of hard disk. I thought the rest must still be in control by Linux. I then ran the Linux setup again and tried to set the partition choice back to the 3.5GB. I thought I had done it but when I reformatted the HDD it only gave me 1GB again.

So, I called up good old Fdisk. Eek! There was a primary partition and an extended partition which both added up to the 3.5GB. I tried all the options but I was denied permission to remove the primary partition because of a logical drive in the extended partition.

In the end I went to my BIOS screen at startup and did a low-level disk format. After this I was able to delete all the partitions using Fdisk and create a primary partition of 3.5GB. Formatting then gave me the full disk, that is 3.5GB.

I then loaded Win98 back on and thought it would be okay. During the reboots in the Windows installation, Linux tried to boot up and then hung because I'd deleted its partition. I got round this by pressing [Tab] at startup and choosing Windows instead of letting it default to Linux. All worked well in the end.

But, the LILO operating system choosing option still comes up. The big question, where is it located and how can I get rid of it?

Ed Glogiewicz



**A** The quick answer is reboot Windows to a command line prompt and type:

**FDISK /MBR**

This rewrites the hard disk's master boot record, which is where LILO has been placed on your machine.

If you want to remove Linux, doing so from the familiar DOS/Windows environment can be tricky because Fdisk won't handle non-DOS partitions. Linux does come with tools that let you remove Linux partitions, but how do you do it if you aren't very familiar with Linux, or maybe can no longer start the Linux OS?

Third party partitioning utilities such as Partition Magic will do the trick. If you don't have that already, it's rather a lot to spend for one job. Instead, download Ranish Partition Manager from [www.users.intercom.com/~ranish/part/](http://www.users.intercom.com/~ranish/part/).

Unzip the file to a directory off C:\ and then reboot to a command line prompt. Type the following, where 'dirname' is replaced with the name of the directory where the software lives:

**CD dirname**

**CWSDPMI**

**PART**

This starts the program. Just in case of trouble, immediately save a copy of the MBR to a file. Copy this to a bootable floppy along with the Ranish program. This enables you to recover

Ranish Partition Manager is really a tool for those that know what they are on about, but follow our instructions and you can safely remove Linux partitions with it.

if everything goes haywire, but it's advisable to have a backup of important files, too.

All you have to do now is run down the list of unwanted partitions and hit [Delete] on each one. Finally press [F2] to write the changed MBR back to the hard disk. Quit the program and reboot.

Windows

## Colour management explained

**Q** Please explain the Colour Management tab in the Display Properties dialog in Windows 98 SE. Is this feature tweakable to my advantage?

Anthony Berry

**A** You need to press the Advanced button on the Settings tab to see this and it may not be present on systems where the card manufacturer has tweaked the dialog. Windows 95 does not have this as standard, but read on... the feature it controls is still relevant.

I bet most people pass over this tab with little more than a puzzled glance. It's actually part of an important part of Windows which has a major influence on the quality of graphics.

Compare a scanned image output on a colour printer with the same image on-screen, and with the original photo. They're never quite the same and are often significantly different.

This is a big issue in professional publishing and printing where colours in a publication must closely match those seen on the monitor, on a printer used for proofing, and in the original artwork. To produce accurate results, a system used professionally has to be calibrated and employ colour management throughout the workflow.

Colours change because hardware doesn't handle them with high fidelity. For example, a printer is physically incapable of representing all the colours your monitor is able to display. The total range of colours a device can handle is known as its gamut.

A colour within the gamuts of two devices probably won't look quite the same on both for various reasons. Take cathode ray tube monitors as an example, and imagine a strip of greys progressing evenly from pure black to pure white. The data values representing this image inside the computer's memory will also progress in even steps from zero (black) to maximum (white). This causes the video card to generate signals whose voltages step up in even progression.

The catch is that the light intensity produced by the cathode ray tube is not directly proportion to the signal level. Consequently, the displayed strip of greys does not increase in brightness evenly. Their measured intensities follow a curve similar to the one shown in the graph. By the way, terms like brightness, intensity and luminance have distinct technical

### USEFUL WEB ADDRESSES

## Getting help on the Internet

How to get information direct from manufacturers and fellow users

**I** If you need an updated driver or other help direct from a manufacturer, see if it has a Web site. One of the search engines will help you locate it – for example

[www.mamma.com](http://www.mamma.com),  
[www.aj.com](http://www.aj.com), [www.hotbot.com](http://www.hotbot.com),  
[www.excite.com](http://www.excite.com) or  
[www.av.com](http://www.av.com). For your convenience, I have compiled a list of Internet addresses of many leading hardware and software manufacturers. It is in the file [hsnet.htm](http://hsnet.htm) which you will find on the SuperDisc every month. Load [hsnet.htm](http://hsnet.htm) into your Web browser, make your Internet connection



SEE OUR **SUPERDISC**

PATH: \handson\files\helpscrm\sites\hsnet.htm

and click the desired link. Why not copy the Sites folder to your hard disk and bookmark [hsnet.htm](http://hsnet.htm) for instant access?

If what you want isn't there and the general search engines turn up tons of irrelevant links, try [www.service911.com/content/SupportHelp.asp](http://www.service911.com/content/SupportHelp.asp) which has a searchable database of tech support contacts. If you find a site I haven't listed, but which could be useful to other readers,

please drop me a line at [ian.sharpe@futurenet.co.uk](mailto:ian.sharpe@futurenet.co.uk).

News groups are also a great source of help and advice. It is likely that your question has been asked and answered before, so before posting a message search previous postings at [www.deja.com](http://www.deja.com). The Power Search option usually gives better results. And don't forget PC Plus' own newsgroups at [www.pcplus.co.uk](http://www.pcplus.co.uk).



definitions, but we'll stick with broad principles and use them interchangeably.

Measured brightness on the CRT closely matches input voltage to the power gamma. The value of gamma varies from system to system. An average cathode ray tube is around 2.2. Notice in the graph that an input signal of 50 per cent full intensity gives a brightness of approximately 22 per cent of the maximum.

The perfect graph has a gamma value of 1 – a straight line at 45 degrees to the axes, passing through the origin. This maps each input colour on to exactly the same output colour.

Each device has its own profile, distorting colour and brightness in its own way. The profile may follow a gamma curve, or it may be a different shape. To represent colour accurately, the response of each device in the chain between input and output must be measured accurately. Compensatory profiles can then be applied to keep the image looking as true as possible.

Computers such as the Apple Macintosh and Silicon Graphics workstations were designed from scratch for professional graphics. They have colour management built in and their gamma values are not the same as an untweaked PC.

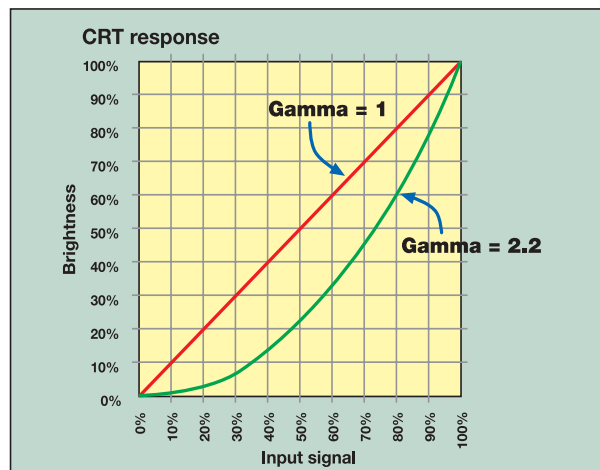
Perfection would seem to be to correct the screen's gamma curve back to a straight line, but reasons relating to human colour perception make this undesirable. The system gamma for a graphics workstation might be between 1.2 and 1.5. System gamma means the residual curve after the CRT's native gamma has been partly compensated for by the hardware and software driving it.

Windows 95 was the first Windows to have support for colour management. Known as ICM (Image Colour Matching) it follows a standard set by the International Color Consortium ([www.color.org](http://www.color.org)). Support for ICM was strengthened in Win98 and 2000. It isn't as sophisticated as the colour management you'd find at a publisher or commercial printer, but it is claimed to be adequate for general use as well as being simpler to implement.

Without ICM you get the following kind of scenario. You have acquired a digital image which almost perfectly represents the original scene. You display it on the monitor. Because of CRT gamma, mid-tones look dull. Highlights are pretty good, but detail in shadow is flattened into uniform blackness.

You use image manipulation software to 'correct' the image so that it looks right on the screen. It may seem okay now, but you have distorted the data to compensate for the gamma of your particular monitor. Inside the file the mid-tones are too pale and shadows have been lifted. Other people whose monitors have a different gamma to yours will see the picture differently.

If you now send the file to the printer, it's unlikely that the device's own profile will match that of the monitor. So you get the distortion you have introduced, plus the distortions native to the printer. No wonder nothing ever matches!



The brightness of a cathode ray tube is not proportional to the signal strength. It follows the gamma curve, giving a darker than expected display.

With colour management throughout the system the story goes like this. Your system has an accurate profile of your monitor, allowing compensation to be applied to the outgoing signal. Without changing the source data, the image's appearance is now close enough to what it should be, and you are not tempted to tinker.

The printer has its own calibrated ICM profile, allowing just the right compensations to be applied to outgoing data. Your printed image matches the screen and the original, as far as is possible within the physical limitations of the devices and media involved.

These days, scanners, cameras, printers and monitors should come with their own ICM profiles. These are stored in files with the extension .ICM in \Windows\System\Color. Win98 and 2000 allow you to right-click these files and select Associate. The resulting dialog enables you to link the file to a device, and also to see internal information which may tell you which device the file is intended for.

The Color Management tab in the display properties is another way of associating profiles with the monitor. Its profile list may be empty, in which case you should try to find an

appropriate ICM file. Some come with Windows, but it's hard to know which if any is right. A profile may be associated with the monitor, but are you sure it's the right one?

If you are unsure, or you didn't get an ICM file with the monitor, and Windows didn't come with one specifically for your model, look on the manufacturer's Web site.

It's worth mentioning that a manufacturer's profile specifically for your monitor still won't be perfect. No two examples of the same model are exactly alike, and they change with age. Brightness and contrast settings, ambient lighting and the physiology of the viewer also play a part.

There are packages which enable you to tailor an ICM for your monitor. Examples are Colorific ([www.colorific.com/products/colorific/welcome.html](http://www.colorific.com/products/colorific/welcome.html)) which is bundled with some displays, and ColorBlind Prove it! ([www.color.com/Products/index.html](http://www.color.com/Products/index.html)). I haven't tried these.

Elsewhere in your system you need to check whether ICM is available and enabled. A printer may be compatible with ICM without mentioning it explicitly (look for tell-tale

## MONITOR TUNING

# How to set brightness and contrast

Get the best from your monitor with this simple procedure

**T**o get best results from your monitor you should adjust the brightness and contrast properly. Leave the monitor switched on for half an hour before following this procedure:

- Make sure the ambient light level is typical, comfortable and not too high;
- Set the contrast to its maximum level;
- Set the display to at least 16-bit colour depth. 24-bit is preferable;
- Open the Web page [bright.htm](#) from \handson\files\helpscrn in your browser, and maximise the window;
- Adjust the brightness so that the white portion appears truly white, the black is the same colour as a switched-off monitor (or the border outside the viewing area) and the grey square in the centre is only just visible against the black background.

**I**f your monitor has colour temperature controls and you don't work in a professional publishing environment, get the best setting as follows:

- Fill the screen with pure white – by maximising a Notepad window, for example, but make sure the title bar is a neutral grey.
- Look out of the window for a while, to allow your eye to adapt to natural light.
- Look at the screen. If in the first few seconds you can see any sort of colour cast, try another temperature and repeat. 6500K is the preferred value, but settle for one which gives the purest white. Keep glancing out of the window to ensure your eyes stay adjusted to natural light.



ICM files), or it may be optional, or it may be unsupported – likely with older models. Obtaining the latest driver may solve that. Note that there should be different ICM profiles for different papers.

With scanners and cameras, if ICM is supported (it may also be labelled sRGB) it could be optional. If you turn it on, make sure any colour calibration mentioned in the manual or in the software is carried out – it can make a striking difference to the result.

ICM compensation might be applied directly to the data, or the data may be left untouched and the ICM profile included in the file. Not all formats have provision for embedded ICM profiles; TIFF and PNG do, for example.

Embedding a profile allows more flexibility and better quality control. If the image file passes from device to device, having an ICM applied to the data each time causes it to degrade. Colours in the original which are missing from a device gamut along the way will be lost. When transformed through an ICM profile, many colour values will want to take on fractional values. Only whole numbers are allowed, so rounding takes place. Colours begin to drift and subtly different hues that were close in value become the same.

The effects accumulate if several ICM transforms are applied. The ideal is for the raw data to be sent around uncorrected, with an ICM attached. Each device calculates a resultant ICM transformation, combining that of the input device with its own. No matter how many places the image travels through, the raw data is present with the full subtlety of its detail intact.

The disadvantages of including an ICM with an uncorrected image are that small files can become a lot larger – a problem on Web pages – and all the software in the chain has to understand what's happening. Support for colour management is patchy on the PC, so this may cause problems. An output device may fail to recognise the ICM and display an uncorrected image. It looks wrong, and someone may decide to change the image data, building a permanent distortion into the file.

## Hardware

### Hard disk failure

**Q** When I switch on my computer it carries out the normal boot memory check and then stops. The hard disk busy light burns brightly and then eventually a message 'Primary master hard disk fail' comes up. After going through this process up to seven times, the computer will start as normal.

I suspected that my Maxtor hard disk was the problem and downloaded test software from its Web site and carried out the 'quick test' and 'read test'. Everything was said to be okay. I did not carry out the 'write test' as it is destructive.

Maxtor literature states to the effect that if these tests are okay then I should not return the drive.

Garth

## DATA SET IS:

X	Y for curve (gamma=2.2)	Y for line (gamma=1)
0.0%	0.0%	0.0%
5.0%	0.1%	5.0%
10.0%	0.6%	10.0%
15.0%	1.5%	15.0%
20.0%	2.9%	20.0%
25.0%	4.7%	25.0%
30.0%	7.1%	30.0%
35.0%	9.9%	35.0%
40.0%	13.3%	40.0%
45.0%	17.3%	45.0%
50.0%	21.8%	50.0%
55.0%	26.8%	55.0%
60.0%	32.5%	60.0%
65.0%	38.8%	65.0%
70.0%	45.6%	70.0%
75.0%	53.1%	75.0%
80.0%	61.2%	80.0%
85.0%	69.9%	85.0%
90.0%	79.3%	90.0%
95.0%	89.3%	95.0%
100.0%	100.0%	100.0%

**A** It sounds like a developing hardware failure, but without examining the computer it is difficult to pin it down. It could be the disk, the drive controller circuitry, or something related to it. There is a small possibility that the slave drive or the cable are at fault.

The symptoms suggest temperature might be a factor: when cold, the PC has difficulty booting. When warm and some thermal expansion has taken place the fault disappears. A hairline crack or borderline connection in some component could cause such behaviour. I had a memory module that did this – the PC saw 32MB when cold and 64MB when warmed up. Lightly cleaning the contacts with a soft pencil eraser cured it.

Reseat all internal cables and plug-in components. Try moving the hard disk to the secondary channel. It will be necessary to change the BIOS setting as well as transferring the cable to the other socket. Make a note of the original BIOS settings before you do so. If that fixes it, you know there is a motherboard problem specific to the primary channel. If the problem persists it just proves that if there is a motherboard problem, it afflicts both channels.

Are you able to borrow another hard disk, or put yours in another machine? That ought to tie the fault to the motherboard or the disk. If you don't have the facility to swap components, there isn't much you can do beyond taking it to a repairer.

## ANTI-VIRUS SOFTWARE



# starletter

## Safety in numbers?

*This month's Star Letter is won by Keld Orum-Petersen. He will receive a copy of Retrospect Backup*

**Q** I use McAfee on both machines on our home network, but the problem with anti-virus programs is you don't know how good yours is until you need it. A friend of mine claims that running two anti-virus programs like McAfee and InoculanIT together on one PC gives added protection. I say no as I see possible conflicts between the two products.

I seem to remember reading that running just one anti virus program is recommended and having two does not do what my friend says. If my friend is correct then there's always the problem of keeping both set of virus definition files up to date in parallel. Please enlighten us.  
**Keld Orum-Petersen**

**A** Do not run two memory-resident virus scanners at once! You are more likely to lose data from conflicts between them than you are to lose it from a virus evading one good scanner whose definition file is frequently updated. Having the two scanners resident is also likely to impact the computer's performance.

You should be safe having one memory-resident scanner monitoring file activity, and a platoon of other scanners that run on demand – provided each one enables you to exclude particular files from the scan so that you can tell them not to look at each others' virus signature databases.

All good scanners overlap on their ability to recognise a huge

number of common viruses. The differences between them mostly lie in the very new or very rare viruses which haven't yet made it into the definition file.

Installing several scanners only adds a smidgen of extra protection and places too much emphasis on one mode of defence. Instead, have one scanner and one good backup program which keeps important files safe with little effort on your part. That will not only protect against viruses, but also most of the other things that destroy valuable files.

Speaking of which, I am awarding your mate this month's prize copy of Retrospect Backup. Nobody else stands out as a deserving case, so it'll help him sleep at night.

## Hardware

### Best memory upgrade

**Q** I have a PC fitted with 64MB of 66MHz SDRAM which I am about to upgrade to 128MB by adding another 64MB module. I would like to have the possibility of later transferring the new memory to a faster machine I intend to build when I have the cash in a few months, so would prefer to fit a 100MHz unit even though the bus runs at 66MHz. I have been told that 100MHz modules will happily run at 66MHz but I am unsure whether the different kinds will work together at this speed.

Is it also possible to estimate how much benefit I will get from this upgrade? I run Windows 95 OSR2 on a 300MHz Celeron. I checked the disk DMA settings as you suggested recently in *Help Screen* and I'm firmly stuck with DMA 2, which is what makes me think increasing the memory ight away should significantly boost performance until I can afford the full upgrade. How much memory should I aim for in the new system?

**Carl Finch**

**A** It is okay to run 100MHz or even 133MHz SDRAM memory at 66MHz, and many people have successfully mixed them at this speed. Others have reported problems, with symptoms including failure to boot up, not all the memory being recognised, or erratic behaviour once running.

The speed difference is the obvious thing to latch on to when the upgrade doesn't work, but the problem may lie elsewhere. For example some motherboards are reported to be quite picky over the brand of RAM fitted. A module may not work in one machine but function perfectly in another, while another brand may work where the first failed. This is due to the quality of the memory module rather than its speed rating, or the quality of the motherboard.

If you want to play safe, take your machine to a shop of good repute and ask for the upgrade to be done for you. It may cost a bit more than buying the part by mail order, but if there are obvious compatibility problems the vendor can try different memory units and you won't be landed with useless RAM.

This graph shows the percentage improvement over the benchmark figure for 32MB of memory in the BapCo database and word processing tests. Most of the benefit is obtained with 96MB. The tail-off in the 128MB Word score is within experimental error and is negligible.



It's frequently said that if you do mix, put the 66MHz memory in the first slot(s) and the 100MHz after it. You may like to consider selling your 66MHz memory and buying a single 128MB 100MHz part if you want to take it all to the new machine and maximise expansion potential. Do check your existing motherboard will take a 128MB module, though.

As for the speed improvement, it all depends on what you're doing and the relative speeds of different parts of your system. A program may load quicker if there's more memory, especially if other programs are already running, but once loaded it will only run faster if the extra memory reduces or eliminates use of the swap file, or allows more efficient caching of disk access. Typing a letter won't be any different. Working with a long report containing embedded graphics may be. Switching from one large running program to another will probably be quicker.

If your system regularly gets bogged down with a lot of disk activity, extra memory should help a lot. You could try to assess the situation using Windows System Monitor (sysmon.exe) utility in a similar way to what I described for the Performance console in Win2000 last month.

To get a feel for the level of improvement you can expect, I installed a fresh copy of Windows 98 SE and ran the BapCo benchmarks that we use in our PC group tests. SE allows you to limit the amount of free memory, so it was easy to get results for 32MB, 64MB, 96MB and 128MB. The BapCo tests are based on real applications, so they do have some relevance to what real people do on real PCs.

BapCo gives headline benchmark figures for office productivity and content creation, and these are combined into an overall score. It also provides individual results for the component applications.

The overall benchmarks change remarkably little between 32MB and 128MB. Content creation improves from 125 to 128 which is too small to be relevant. Productivity fares better, going from 110 to 124 – about 13 per cent better. The overall BapCo rating steps up from 116 to 126 – nearly nine per cent.

That doesn't sound much extra bang for 65 quid's worth of SDRAM, does it? Closer examination of the results reveals a different picture, however. About half of the applications

## CORRECTION

### Best scan resolution

*The formula in issue 164's Help Screen was bugged – here's the update*

**I** must apologise for a typing error I made when copying Lionel Gooder's letter for issue 164's *Help Screen*. The example in the text is correct but the formula is scrambled. It should have read:

**SR = (WP x RP) / WO**  
**SR = Scan resolution**  
**WP = Width of printed picture**  
**RP = Resolution of printer**  
**WO = Width of original picture**

The answer will rarely match the available scanner settings – always round up to the next highest figure.

showed between no and 10 per cent improvement. It's a fair bet that these have modest memory requirements and didn't increase use of the disk, even in 32MB of memory. The three top improvers jumped 17, 20 and 25 per cent respectively. That's not bad, and it would be better if the data files had been larger or another program had been occupying some of the memory.

Another interesting fact emerges when we examine how little memory has to be added to get most of the improvement. The figures for 96MB are significantly ahead of the ones of 64MB, and close to those for 128MB. So in this test, 96MB is the point at which spraying more money on it achieves little.

Remember that this was a virgin installation of SE. If more memory had been taken up by drivers and toolbar gadgets, as it is on most machines after they have been used for a while, the swapfile would have been used earlier, less disk cache would be available, and the optimum memory level would be a touch higher – 128MB in round figures. Also bear in mind that 98SE uses memory more efficiently than 95 in some respects.

From this we can establish a rule of thumb: 64MB is adequate for light to medium use. 128MB is entirely justifiable if you often run more than one major program at once or work with larger data files. Go for more than 128MB if you do both together, or work with huge data files. But don't lash out on 192 or 256MB without good reason – the extra money may not buy an appreciable improvement and might buy more boost if spent elsewhere.

## DATA SET IS:

	Paradox	Word
64MB	8%	3%
96MB	16%	15%
128MB	17%	14%



YOUR QUESTIONS ANSWERED ON POPULAR APPLICATIONS

# Application workshop

*Help with Word's wayward warp-speed mouse, and plenty more!*

## Adobe PhotoDeluxe

### It parsed out

**Q** Help! My scanner came with a copy of Adobe PhotoDeluxe Home Edition 3.0. Everything was hunky dory until I tried to load one of the templates – readymade layout for photo albums, calendars, certificates, posters and the like.

A message at the bottom of the window tells me that the program is “Parsing generic EPS format”, whatever that means. Then I get a dialog saying that the parser module cannot parse the file. The supplier of the scanner basically said “No comprendo, Señora” and suggested I try the Adobe Web site, but it's big and slow and I can't see anything. Any ideas?

**Ruth Neville**

**A** The answer's there, but you have to dig in the right place. This is a known problem with PhotoDeluxe running on systems which have Office 2000, Windows 2000 or Windows 98 SE installed. Go to [www.adobe.com/support/downloads/pdlxhewin.htm](http://www.adobe.com/support/downloads/pdlxhewin.htm) and get a copy of Parser.exe. Run it to unpack a couple of files. Make sure PhotoDeluxe is not running and copy EPSParser.8by to the PlugIns folder of your PhotoDeluxe installation. While you're at the Adobe site, look at [www.adobe.com/support/forums/main.html](http://www.adobe.com/support/forums/main.html) where there are forums where users can exchange information.

EPS files contain instructions which describe how to draw a document. They are used mainly in professional publishing, where output devices

are controlled by the PostScript page description language invented by Adobe. When a document is printed, it is converted to a stream of PostScript commands which tell the printer how to construct each page. EPS (Encapsulated PostScript) files are almost the same, and contain a low-resolution bitmap representation of the document. This enables applications to quickly put a preview on the screen.

Adobe has used this format for its PhotoDeluxe templates. The embedded preview enables thumbnails to be displayed in a catalogue. When you select a template, PhotoDeluxe must read (that is, ‘parse’) and obey the PostScript commands in order to present the template for editing.

## Word

### Scrolling too fast

**Q** In Word 97, if I want to highlight a lot of text to change the format, I click and drag the mouse over the text. If some of the text is off the screen I push the mouse over the top of the window but, within a microsecond, my mouse is at the top of the document with more text than I wanted to highlight! Push the mouse back down again and I bounce back to the bottom! Is there any way to slow down the scrolling?

**Martin Van Eker**

**A** Half the world wants the answer to that one! The speed increases as you move the pointer further out of the window. The trouble is that on modern PCs the minimum velocity is usually about Warp Factor 3. There is no setting

to change this, unless your video card driver is one of the rare ones with that option, so try these alternatives:

- Click once at the end of the text you want to select. Go to the other end using the scrollbar and shift-click there. All the intervening text will be selected.

- Use [Shift] plus the up and down arrow keys, or [Page Up] / [Page Down].

- Press [F8] to go into extend selection mode. From there, repeatedly pressing [F8] extends the selection to the nearest word, then the current sentence, then the paragraph and so on. Or you can press any key to have the selection extended to the next instance of that character – such as ‘.’ to jump forward sentence by sentence. This also works with [Enter] to take you to the end of the paragraph. Moving around with the arrow or page keys extends the selection as if you had pressed [Shift]. Press [Esc] to leave extend mode.

- Get a mouse with a wheel.

## Excel

### Greyed-out undo

**Q** I have a number of macros in Microsoft Excel, mostly recorded ones. I am not much of a programmer but I did manage to write a few simple Subs from scratch in the VBA editor using recorded macros as starting points.

My problem is the undo feature. After running my macros it is usually greyed out on the Edit menu and [Ctrl][Z] does nothing. Is this a bug in Excel or am I doing something wrong?

**Robert Lawrence**

**A** It isn't a bug, just the way Excel is designed – you will often observe the same thing after running macros written by experts. To provide multi-level undo, the application has to maintain a list of the most recent changes. If a step is missing, the file cannot be put back how it was before the action performed by the missing entry. When such a thing happens, Excel wipes the undo history prior to the missing entry.

Excel's own menu and toolbar commands are programmed to add their own entries to the undo list, thus building a path along which the undo feature can backtrack. It's the same with the repeat list – the tools add entries to it.

Macros are different – they can perform actions unavailable through the user interface and access Excel's features at a lower level than



PhotoDeluxe goes out of its way to be friendly, but inscrutable error messages lurk in the shadows.



the buttons and menus, by-passing the add-to-undo functionality. Excel's designers played safe and easy with macros. If you want to maintain the undo and repeat lists, it's up to you to write special undo/repeat procedures and register them with Excel. Look up Application.OnUndo and Application.OnRepeat in the on-line help for VBA. Also see [www.j-walk.com/ss/excel/tips/tip23.htm](http://www.j-walk.com/ss/excel/tips/tip23.htm) which explores the issue further.

## Excel

### High-visibility selection

**Q** At work, I find novice users frequently appear 'blind' as to where the cursor is located when trying to enter data into an Excel worksheet. Is there a way to have the background colour of a cell change when it is selected?

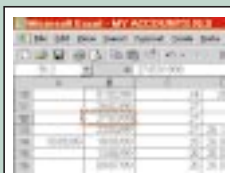
**D Robertson**



SEE OUR **SUPERDISC**

PATH: \handson\files\helpscrn\

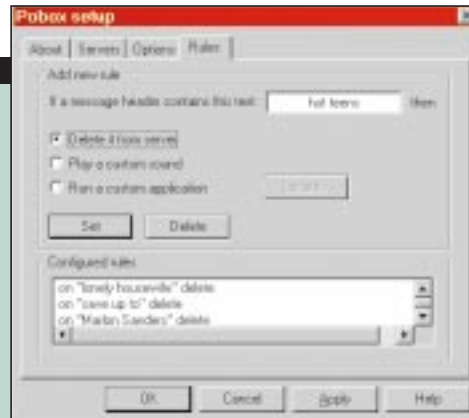
**A** I normally tap one of the arrow keys to make the selection move, but changing the appearance of the active cell is such an obvious customisation that you'd think it must be tucked away somewhere. Apparently not – there's an Excel 2000 registry hack to change the colour of the selected range to white on black, but nothing I can find for the selected cell.



You can't miss it on the screen – a blinking red box around the selected cell.

The background colour can easily be changed with macro code, but it gets horribly messy when you try to avoid unwanted side effects. It's a bit less troublesome to draw a high-visibility box around the active cell. On the *SuperDisc* is an add-in called SelectionHighlight.xla. It's for Excel 97 and 2000 only. Copy the file to your hard disk, then go to Tools / Add-Ins and click Browse. Pick the add-in, ensure it is now present and ticked in the list, and you're away.

Highlighting is turned on by default. [Ctrl][F1] turns it off for the current session only. I'm afraid that while high-visibility mode is turned on you lose the undo feature, for the reason explained in this month's other Excel answer. If enough people



Spam filters generally check incoming mail for blacklisted phrases and addresses.

tell me it's worth pursuing I will have a shot at solving this for version 2.

## Outlook

### Spam stoppers

**Q** I would like to know if there is a way to set up a rule to tell Outlook 2000 not to download messages from a certain sender. I know you can set up the junk mail filters, but this doesn't stop the messages from being downloaded. I would also like to know if I can stop mail being downloaded if it contains an attachment, and have a message box pop up to tell the user that mail with attachments has been left on the server. Perhaps this could be done using VBA?

**Rob Campbell**

**A** It's a fine idea which Microsoft should have taken up long ago. It did, in fact – but only when Outlook runs in conjunction with Microsoft Exchange Server. Copies of rules you set up in Outlook are also stored by Exchange which actions whatever it can before delivering messages to Outlook. Some rules cannot be applied on the server – moving a message to a local folder, for example – so they are left for Outlook to perform after it has downloaded messages.

Interesting, but no use to the millions who don't access e-mail via Exchange Server. Rules can only be applied to messages after they have been downloaded. It's probably possible to do a few things on the server with VBA, but I have a hunch that such a project is beyond the time allotted to these few column inches.

A fair compromise would be to run a small proxy mail server which has the required features. It would collect your e-mail and Outlook would be directed to get messages from the proxy. I wasn't able to find a free/cheap lightweight option here – if anyone knows of one, please let me know.

In the meantime, here are some free alternatives you may like to try out. They all involve having a program check your mailbox and apply filters before you get Outlook to download messages.



PureMail has a novel approach to junk busting – it'll only accept mail from people quoting authorised stamps.

Option one was on issue 165's *SuperDisc*. PoBox ([www.antimensch.de/coding/](http://www.antimensch.de/coding/)) regularly checks your account and alerts you to new e-mail. You can define filters based on searched-for text in mail headers, deleting those messages from the server when found. By clicking on the PoBox tray icon you can get it to check mail straight away, so you can have your mailbox cleared of unwanted mail before Outlook downloads the rest.

Option two is PureMail ([www.geocities.com/Heartland/Prairie/2098/pm-intro.htm](http://www.geocities.com/Heartland/Prairie/2098/pm-intro.htm)). This is an entirely different kind of beast which rejects messages from users you haven't authorised to mail you. I can't say how convenient it would be when used in anger, but it's certainly an interesting concept which deserves a hearing.

This quote from the help file gives the gist of the PureMail method: "PureMail consists of a unique stamp that the sender generates, and adds to their outgoing e-mail. The receiver must include the stamp when responding to the e-mail. A recipient with PureMail will then search for the stamp in its database to make sure that the stamp is valid, and has not expired. Thus, we know if the e-mail is legitimate or not".

An example of a more conventional spam filter is AntiSpam ([http://members.xoom.com/dd\\_software/](http://members.xoom.com/dd_software/)) which deletes files received from domains you don't blacklisted in a text file. The only thing I don't like about this program is that, unlike the previous two, it can't launch your e-mail client after checking so it's slightly less convenient. More sophisticated is SpamBuster, an ad-supported program available from [www.contactplus.com/products/spam/spam.htm](http://www.contactplus.com/products/spam/spam.htm).

None of these programs deals specifically with attachments but Outlook can block messages above a specified size – see Tools / Options / Mail delivery. It'll warn you when an oversize message wasn't downloaded and does not delete it from the server. You can then decide whether to disable the setting and allow the download, or use a third party utility to delete the message from the server – or use the Telnet technique I described in issue 163. **PCP**





Malcolm Wheatley flew to Seattle to interview Jeff Bezos, founder and chief executive of **Amazon.com**. It's a critical time for Amazon: in the wake of **Boo.com**'s collapse, as well as several other high-profile American dot.com failures, investors are getting nervous – and Amazon has never made a profit, although the company insists that it will be cash-positive this year. Still think of Amazon as books? Think again – and take quick look at **Amazon.com** (not **Amazon.co.uk**, which is still some way behind its US parent). CDs, videos, DVDs, gardening stuff, cooking equipment, toys, lawn and patio gear – and more besides.

# Jeff Bezos

**Q** Clearly, customer service – or the 'end-to-end, order-to-delivery customer experience', as you call it at Amazon – is a vital part of Amazon's competitive edge. But why did you choose that as a competitive differentiator, and not, say, price or choice?

**A** There are several things that are important to Amazon.com customers – and we've studied this, so as well as knowing it anecdotally, we know it through doing qualitative studies. People care about selection, people care about price, and people care about service. They also care about rich information – so that they can make a better purchase decision – and about ease-of-use. So we focus on all of those things when we're building our stores.

But the end-to-end customer experience is even more important on-line than it is in the physical world. And the reason for that is that on-line, the word-of-mouth impact is more amplified. Every Internet customer has a big megaphone, and if we make a customer unhappy, they don't tell five friends, they tell 5,000.

**Q** And the reverse is true?

**A** And the reverse is true! You create evangelists. If you do a great job for

customers, then they tell 5,000 friends, in newsgroups and listservers and chat areas and so on – so that on-line, your marketing dollars are best spent building great customer experiences.

**Q** Do you have any numbers or statistics to support that?

**A** No – but we do believe, based on surveys that we have done, that more than half of our new customers come to us through word-of-mouth. And I can tell you that in our first year, we did not do a dollar of paid advertising, and we still grew incredibly rapidly. Today, we do a significant amount of paid advertising, but it still accounts for less than half of our new customers.

**Q** That's remarkable...

**A** And here's something else: two years ago, we were US-only, and books only. We weren't selling music, or videos, or any of the other product categories we now sell, and we didn't have **Amazon.co.uk**, or **Amazon.de**. And two years later, although our US books business has continued to grow rapidly, more than half of our revenues come from these new categories and businesses. And a lot of that has also been word of mouth.

**Q** But the international expansion has also opened up price discrepancies. Several **PC Plus** readers have pointed out that it can be cheaper to buy from **Amazon.com** than from **Amazon.co.uk** – in other words, exactly the same product, at two different prices. Why is this?

**A** This is one of those things about the world that makes no sense. Many companies – manufacturers and publishers – offer their products at a lower price in the US than they do in other countries. Why this is the case, I don't know. I don't understand it.

But they do do that, and I know that this strategy of price differentiating based on the country of sale is going to be less and less successful. Why? Because it used to be very hard for consumers to know that this was going on. Take CDs: consistently, the big music studios have charged US customers their lowest prices, and have charged European customers, and others, their highest prices. And I don't know why that's so, but it is.

Now, it used to be that they would get away with it, because it was either very hard to notice, or at the very least it wasn't rubbed in your face. But now, any consumer in any country can look at any price on any product anywhere in the world – and it takes just a few seconds to do that. So I



# interview

**'Most of the early mistakes we made turned out in retrospect to be lucky good decisions. Even when we should have been wrong, we were in some cases accidentally right'**



think that customers over time are going to simply reject that pricing strategy. But in the meantime, at **Amazon.com**, we're not allowed – for example – to take the US version of some products and ship them to some countries. We have to take the local versions – and those local versions often cost more.

**Q** Hmm. At the moment, it tends to be consumers themselves who hunt for the best deal. Clearly, Amazon is a great brand, and people come to Amazon for all that it offers. But in the coming era of Internet-based comparator shopping, when people use 'intelligent agents' to search the Net for the best price, how will you compete then?

**A** Well, first, we'll just have the best price. That's the simple approach. But second, we will be that shopping agent – that's what we're trying to do: to be that personalised shopping agent that not only finds you the best price, but also the best product. This is a much more sophisticated thing to do than a situation where you already know what you want, and the shopping agent is simply trying to find the best price.

Specifically, though, I think we'll compete on price, as we do now. What people miss on the pricing front is that e-commerce is a scale business, meaning that your costs are largely fixed, and as your business grows, you are able to offer lower prices, so that it should be possible for us to not only have the lowest prices, but also the best service. And that is counter-intuitive, because in the physical world, which is a variable cost business, you intuitively know that you can't offer the best service and the lowest prices – there's a trade-off. But that trade-off breaks down in the on-line world.

**Q** You're seen as something of a role model in the e-commerce world – you'll soon be speaking at the Digital Britain conference, for example. Have you any lessons or learning points to pass on to others who want to follow in your footsteps?

**A** The reason that we have been successful is that we have been absolutely, obsessively and compulsively focused on every aspect of the customer experience. So if someone was to ask me for advice, that's what I would tell them:

take an area where you know you can create real value for customers, and then obsessively work on the end-to-end customer experience – every aspect of it. I think that's the thing I'd advise – and it will work better on-line than in the physical world.

**Q** What about learning points for yourself – things that you'd do differently, with the benefit of hindsight?

**A** Most of the early mistakes we made turned out in retrospect to be lucky good decisions. Even when we should have been wrong, we were in some cases accidentally right. For example, we launched the store with 1.1 million book titles, against all the good advice from people who actually knew the book industry, who told us to launch with 300,000 titles and to gradually grow. And I think that although our decision was a foolhardy one, it turned out to be a good decision, because that's the thing that **Amazon.com** became known for.

**Q** What about the 'Microsoft syndrome'. You're in the same town as Microsoft, and are another giant with substantial market share. Have you learned anything from Microsoft's small difficulties with the Department of Justice?

**A** It's important to understand that the situations are very different with respect to market share. The market that we address is the worldwide retail marketplace, which is a \$5 trillion marketplace, and our share of that is a tiny, tiny, fraction – less than one-tenth of a per cent. And we have competitors in the physical world who are a hundred times larger than we are.

But even defining the market as on-line sales – not on-line book sales, because we're a lot more than that – some of the industry estimates that I've seen show that even though we're eight times larger than our nearest rival competitor, our segment share of that on-line marketplace might be just 10 per cent to 20 per cent or something like that.

In other words, the retail industry is different: retail is so big, that there's room for lots of winners. Which is why, in the physical world, that there are lots of winners. And there are going to be lots of winners on-line. Other companies do not

have to lose for Amazon.com to do well. So I think that our situations with respect to market share are night and day.

**Q** So what's the latest on the 'one click' patent lawsuit?

**A** There's no new news since we won our preliminary injunction.

**Q** And you don't think that that leaves you open to accusations of stifling innovation?

**A** Certainly that particular innovation does not. But I do think that there is a potential problem with patents – software patents and business method patents – which is that the life time of those patents is too long. If you're building a physical process, then maybe 17 or 20 years is a reasonable patent lifetime. But if you're doing a piece of software, then 3 – 5 years would be enough – but that's not how the patent system works.

**Q** Finally, I understand that back when you started Amazon.com, your parents invested \$300,000 in it, which was a huge chunk of the money that they'd put aside for retirement. Did it feel scary to have that much riding on Amazon.com?

**A** Well, I was very straightforward with them, and I told them that there was about a 70 per cent chance that they'd lose all their money, and a 30 per cent chance that they would not. And even then, I was giving myself triple the usual startup odds, because 90 per cent of these companies fail.

But that's sort of liberating in a way: you say, chances are that this isn't going to work, are you sure that you want to do this? That sort of takes the pressure off. But I think that many people – and I know I'm one of them – are motivated by other people counting on them. So the more that **Amazon.com** has gone on, and got a larger customer base, and a larger shareholder base and so on, the more motivated I have become. And I think that that's a very common human motivating factor, and that's why teams are so successful compared with individuals and so on. **PCP**



# mailbox



*This month: problems locating the Visoneer One-Touch scanner, why we are still using the QWERTY keyboard and the effects of the X-Box on PC gaming*



## DVD movies

I just wanted to drop you a line saying how much I needed the latest issue of *PC Plus*. The reason? The article on cracking DVD-ROM regional coding. It seems that most PC magazines (and also quite a few major manufacturers and suppliers) seem to take a very snobbish attitude and pretend that they know nothing about a practice that I personally regard as essential.

As you quite rightly said "the avid video buff... will regard being stuck with just one region after five changes is ridiculous".

When I was looking to buy a new PC, I contacted almost all the suppliers in your magazine asking if they knew whether the DVD-ROMs in their machines could be altered for multi-region play and nearly all came back with something along the lines of "no certainly not and we cannot supply them in any other way except for region 2".

Most computer publications only occasionally, if ever, mention region coding in fleeting text references, some choosing just to state 'Britain is region 2' whereas others mention 'you may be able to get around the problem' but then providing no further information – what use is that? That is why I want to personally thank *PC Plus* for bucking the trend and acting in the consumer's best interest instead of the industry's.

**Dave Wilson**

## Keyboard confusion

With regards to the QWERTY keyboard layout; were you aware that it was originally set out to stop the keys of a typewriter sticking together? This was because the most commonly used keys were placed in close proximity to each other. This problem would not happen with an electronic keyboard – so why is it still being used? I would have thought it was common sense to abandon this method in favour of the original layout where the most commonly used keys are thrown together in the centre and the less used ones surrounding them on the periphery. Is this The Emperor's New Clothes Syndrome of people being too afraid to say anything about it in case they fall out of favour? Or is it tightfistedness of the manufacturers who don't want to go to the trouble of changing all their production machinery, to produce something that's more user friendly and therefore more saleable (profitable)? It could gain whoever manufactures it an edge over its competitors.

**Tony Sandy**

The age of computing has thrown up several competitors to the QWERTY layout but none has succeeded, despite being generally easier and faster to use. The reason is neither fear nor tightfistedness; it is inertia. The average computer user takes years to develop half-decent typing skill – for them, the prospect of learning a completely new system from scratch is absolutely horrendous!

## PC Plus on trial!

Perhaps you had better turn your *Campaign's* evil eye unto thyself this week! With regards

to your recent Command Antivirus Software Suite, which was given away on your magazine cover disc, may I ask, what has happened to the free update of virus definitions?

You quite clearly stated in the magazine that Command are giving free updates for a full year. However, it appears that they are not! I filled in the on-line form, and have yet to receive my passwords for the updates! I suspect that the free updates for a year was merely an 'eye catcher' to move the magazine.

**A Preston**

If anyone is still waiting for the passwords, don't worry! Command has been overwhelmed by the take-up on our free offer and is ploughing through the backlog as quickly as it can.

## Addicted to Linux

It was nice to see a level-headed debate about our two favourite OSes in *PC Plus* last month – makes a change from the usual yar-boo-sucks.

I use Linux (uh-oh, here we go), and it does crash occasionally, usually because I've done something stupid as root (I know I shouldn't, but it's so addictive) but sometimes for no readily apparent reason at all. It's never been unfixable, even by a non-expert like me, but all the same it's perhaps not as rock-solid as some people claim.

That said, I will continue using Linux because I really like it. I built my current PC from bits and installed Linux originally as a stopgap until I could afford to buy Windows for it, but ended up falling in love with the penguin (though not literally).

I see Windows like an automatic transmission in a car.



## FEEDBACK

### Write to *PC Plus*!

*Let us know what you think of the magazine*

**W**hat do you like (or dislike) about the magazine? What would you like to see? And what do you think about the products and companies in the PC industry? Whatever the answer, we want to know.

- Please write in. Short, concise letters or e-mails are much more likely to be used, as life's too short to extract the important bits from a massive submission. We'll be giving a Star Letter prize away in future issues, so get those letters coming in.
- E-mail is the best way to send your comments. For *Mailbox* send them to: [pcplus.editor@futurenet.co.uk](mailto:pcplus.editor@futurenet.co.uk) or fax them to: 01225 732295.
- Alternatively, print your letter and send to: Mailbox, PC Plus, Future Publishing, 30 Monmouth Street, Bath BA1 2BW.
- Every letter will be read by the editor, and the most interesting (not the most complimentary!) letters will be printed and answered on these pages. We reserve the right to edit letters to fit, and the opinions expressed on these pages are those of *PC Plus* readers, and do not necessarily represent those of the editorial team. Letters and e-mails are assumed to be for publication unless stated otherwise, and published versions of letters become copyright Future Publishing.
- We regret that we can't always answer letters personally, but questions of general interest may also be covered in *Help Screen*.



## PCPlus

Why bother changing gears yourself when the machine can do it all for you? Yet the vast majority of motorists prefer a manual gearbox, because they have more direct control, and this, to me, is like Linux.

Like I say, I'm no expert, but it seems to me that there is room for both Windows and Linux in the world – it's just a matter of personal taste. Some people like manual, some like automatic – it doesn't mean that one is inherently better than the other.

**Scott Berry**

## Prod for back issues on CD

I know this has been asked many time before but I wanted to know if there was any progress towards getting a back issues CD? Something more solid than a 'is being considered but will take a while' (which I recall is the standard answer) would be appreciated.

I am reminded of the need for this as I move house and those back issues take a bit of space...

**Steve**

From [pcplus.mailbox](mailto:pcplus.mailbox)

The wait is over! We've now produced a brand new version of the back issues CD, which includes a full 18 months of features from *PC Plus* in Acrobat format, for you to search, browse or print.

What's more, if you subscribe now (or renew your subscription), it's FREE! Existing subscribers can also buy the disc at half price, but it's available to all... see page 281 in this issue for full details.

This will now be a regular feature, so your shelves can recover from the weight of all those issues!

## Acronym antics

I was reading your June 2000 issue when I came across your awarded 'Star Letter' and became mildly concerned. It is worrying that a software engineer and an electronic engineer were not aware of why MIPS ratings are not used. I am a second year Electronic Engineering student studying at University. Less than a month ago I attended a 45 minute lecture shared with the computer engineering students and took a copy of the associated notes which stated

with a lot of padding the same as the reply your magazine gave. We were given the following industry 'expression'. What does MIPS stand for? Meaningless Indicator of Processor Speed.

I was surprised that some people in the industry were unaware of fundamental basics but then again, it bodes well for my future job prospects...

**Cliff Chandler**

## Going underground

I don't normally take exception to the content of your magazine. I have been a reader (and subscriber) ever since you started to release cover CDs. I like your publication as it is credible, full of good advice and with standards.

I was therefore amazed that you would publicise a link to an underground Web site within your magazine. In July 2000, reader Michael Houston provided details of a site that would help in the resetting of Bios passwords. This carried an endorsement of 'Excellent recommendation' by you. Have you checked this site? Are you aware of the hints and tips for defrauding Cable, Satellite and Telephone companies? Are you aware of the information contained relating to the creation of viruses and the hacking into bona-fide software?

I know that we are all adults (well some of us anyway), and that there is much 'subversive' information available over the Internet. I also recognise that there is some very good and useful information contained within that site. However, I do have to ask how much damage has been done to the credibility of your (no, our) magazine, by actively directing people to information, which we cannot, truthfully, condone the use of, especially when much of the information promotes the breaking of laws (fraud), and of licensing agreements.

**Geoff Cheshire**

Thanks for your comments, Geoff. Our 'excellent recommendation' comment applied to the BIOS cracks – if you've ever forgotten a BIOS password, you'll know the misery it can cause! We do understand your concerns but, in the Internet age, anyone can get

## BEST SPEECH

# starletter

## Prize Winner

## WIN A 19-inch TAXAN MONITOR!

Each month we are offering a fantastic 19-inch Taxan Ergovision 975 TCO 99 monitor worth £309 to the Letter of the Month. Perfectly flat from edge to edge, this superb high-resolution monitor with DIAMONDTRON Natural Flat (NF) screen represents a significant advance in display technology, offering accurate, pixel-perfect image reproduction. The Ergovision 975 TCO 99 comes complete with built-in USB hub and meets the TCO 99 environmental labelling standards. For the complete range of Taxan monitors, call 01344 484646 or visit the Web site at [www.taxan.co.uk](http://www.taxan.co.uk)



## Hints for Hitchcock

It's good to see desktop video becoming more of a mainstream computer hobby, and while your review of video products was interesting, I think that there are still some important facts that a would-be Hitchcock needs to be aware of.

Digital Video (DV) is a perhaps the easiest way to get moving images from your camera to the computer, but getting the edited masterpiece back again is impossible if your camcorder is not DV-in enabled. To take advantage of the cheaper import duty for the non-recording cameras most manufacturers disable the DV-in on their cameras in Europe. To get around this the consumer is faced with two scenarios: buy a PAL camera in the States, or get a 'widget' to re-enable this feature. US models can, of course, be a pain if something goes wrong, and the 'widget' will invalidate your guarantee.

Depending on your make and model of camera this will be less or more difficult. I have had great success with a SONY PC1 and a software fix from LnyxDV ([www.lnyxdv.com](http://www.lnyxdv.com)). To be fair your review mentions this, but it's unlikely that a Saturday lad at your local Dixons will have a clue what DV-in means and you may be faced with a model that does not work. I know a few people whose choice of camcorder would have been different, had they known this in advance.

Second, there is a lot to be said for looking closely at the support areas on the different manufacturers' Web sites. If I had, I would never have purchased an MP10 from Pinnacle. The number of problems that this machine has is incredible, and my own experience of Pinnacle's support was that they really don't care. Fortunately, PC World let me exchange it for a Pyro DV card. Installation was not perfect first time, but was fixed after a look at its Web site and one promptly returned e-mail. As the Pyro is cheap and comes with the excellent Ulead Media Studio Pro 6, I'm surprised you didn't give it a mention.

**Peter Jackson**

hold of the information on that Web site simply by typing in a few words at search engine. More importantly, any *PC Plus* readers who want to engage in the illegal activities you describe will already have found the information. We certainly don't condone fraud, virus creation or cracking and calling it an 'underground' Web site only adds to the hysterical notion that there is an organised sub-culture at large on the

Internet, intent on destroying the fabric of respectable society.

## Scanning the horizon

Since your review last month where you said that the Visioneer One-Touch 8100 scanner is the bee's knees I have been trying to track one down. I have called the telephone number given as the contact point for



Visioneer, it turns out to be Visioneer technical support who claim that you can get them at PC World or Dixons (yeah right). Please could you tell me where you managed to get hold of one of these items, or where I can purchase one in the UK. It seems a shame if I cannot take your advice on the 'best of breed' because of a supply problem. Any information would be gratefully received.

**Keary Birch**

This problem came to light as soon as the review hit the streets. Visioneer gave us their technical support line as the contact number but neglected to tell the support staff anything about it. This had obviously been sorted by the time you called because they knew about the exclusive deal with PC World and Dixons (this model is not available from any other company).

Unfortunately, it seems that not all stores in the Dixons group are stocking this model at present, which is a crazy situation – Dixons and Visioneer lose sales, and you can't buy the scanner you want.

### The X-Box factor

Two days ago I bought the July 2000 edition of *PC Plus* and as I read through it I came across a very interesting point. The Microsoft X-Box that seems to be an animal of a machine for gaming. All the fancy figures

seem to put to shame the latest PC hardware including the new GeForce 2 and Voodoo 5500 class of new hardware. Before the PlayStation 2 was launched, in the official PlayStation launch anniversary magazine, it said that the PS2 will out perform most consumer PCs when it comes to the job of playing games. So does this actually mean that PC gaming has finally met its match? And does it mean that soon every PC owner will also own an X-Box or PS2 for just playing games? Well, if the stats are anything to go by I will definitely buy a PS2 and perhaps an X-Box, despite the fact I have been PC gaming all my life.

**Alan Jue Liu**

Well, buying *all* the different competitors in the future home-console vs PC wars is certainly one way to ensure you don't lose out! Those readers with a little less spare cash will need to decide whether an X-Box or PlayStation 2 suits their needs. The problem with the X-Box, despite all the hype, is that it isn't going to actually exist for quite some time. Only then will we be able to tell whether the PC is dead as a gaming platform. Our hunch, for what it's worth, is that certain types of games will continue to be better suited to PC-based playing, just as some will continue to be far more playable on consoles.

### READER WEB SITES

## Recommended sites from PC Plus readers

#### Reader: Phillip Burton

**What the site offers:** "On my new Web site, I have a spreadsheet with even fuller details of the *PC Plus SuperDiscs* from July 1995 to June 2000. I have taken a summary of your descriptions from your menu pages."

**We think:** Nice one – that makes two *PC Plus* index sites in as many months.

**Visit:** [www.atburton.freemove.co.uk/PC Plus/](http://www.atburton.freemove.co.uk/PC Plus/)

#### Reader: Mike Everley

**What the site offers:** "A Web-site with information on occupational health and safety for students, safety practitioners and others interested in the subject. All material available to download."

**We think:** A good example of how to make lots of information easily accessible.

**Visit:** [www.mike.everley.freeuk.com](http://www.mike.everley.freeuk.com)

#### Reader: Matt Richards

**What the site offers:** "I hope to become the biggest Linux resource in the UK. The Web site, is simply a database of Web sites, organised by rating 1 – 10. The only problem is, it needs filling up. I need as many people as possible to input their recommended sites. From Newbies to gurus – the site is designed for all"

**We think:** Linux fans should definitely check this one out.

**Visit:** [www.lusers.co.uk](http://www.lusers.co.uk)

#### Reader: Mike Everley

**What the site offers:** "Cherrill's Gallery: a gallery of paintings by Cherrill Everley. Oil, Watercolour, Acrylic, Pastel and so on. Covers still life, figures, landscape and an exhibition."

**We think:** Mike's second entry this month is well worth a visit.

**Visit:** [www.mike.everley.freeuk.com/cherrill](http://www.mike.everley.freeuk.com/cherrill)

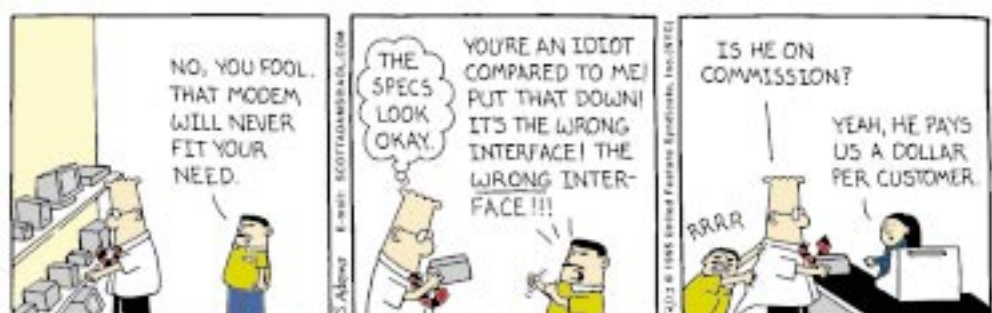
You might not be an idiot, but we do know software protection and we won't sell you the wrong solution. We'll even tell you if you aren't using our products properly. Why not review your software protection measures with the experts. Contact us today, discuss your requirements and order a *Free Developer Kit*.



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Fax +44 (0) 1823 352358  
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*Software Protection that works*



...and he works for us



## Intel faces a huge PC recall

*i820 chipsets with SDRAM are affected*

**I**ntel is faced with claims from up to one million PC users. A chipset problem is causing some PCs to freeze or reboot at random intervals. Specifically, the problem affects PCs bought after 1st November 1999 with the i820 chipset and SDRAM. Intel has released a tool that establishes whether a PC is affected by this problem. This is available in versions for DOS and Windows and can be downloaded from

[www.intel.com/support/mth](http://www.intel.com/support/mth).

The problem is caused by the Memory Translator Hub (MTH) chip that is used with SDRAM memory. The i820 chipset was designed to work with the more expensive Rambus



Download the Intel tool to see if your PC has the problem.

memory and both Rambus and RDRAM are not effected by the issue. The MTH chip has also not been used in any notebooks. All this follows a previous problem with MTH. Back in March, intermittent errors were found in SDRAM subsystems when a memory stress test was run.

At the time of writing, PC manufacturers were not releasing any systems affected by the problem. Intel has stopped shipping the MTH component and a new version of MTH is expected to be released in the third quarter of this year. In a document on its Web site, the company has said that it will be offering existing users refunds on replacements. This can be found at [www.intel.com/support/mth/wtdcc820.htm](http://www.intel.com/support/mth/wtdcc820.htm). Any users who think they are affected should contact their PC manufacturer.

Meanwhile, the end of Intel's Celeron processor is in sight. The 633MHz and 666MHz models are out now. These will be followed by 700MHz and 733MHz chips later in the year. But the Celeron is likely to have disappeared by the end of the first quarter of 2001. Intel has met with some success with this second generation of the Celeron. The first version was less popular, after being rushed out to compete with AMD in the lower end of the market. The processor has not been helped by the lack of knowledge of some sales staff. The Celeron is likely to be replaced by the chip currently code-named Timna.

### HARDWARE NEWS

#### CREATIVE ACCOUNTING

Until the end of September, Creative Labs is offering cashback on certain SoundBlaster upgrades. There's £25 cashback with the SB Live! Platinum card, £15 with the SB Live! Player 1024 and £5 with the SB 16 PCI card. Instructions for claiming the refund are included within the packaging and the offer does not apply to multimedia kits. Users who bought one of these cards after 1st April 2000 can e-mail [support@creative-labs.co.uk](mailto:support@creative-labs.co.uk) if their pack did not include the cashback documentation. More information can be found at [www.europe.creative.com](http://www.europe.creative.com).

#### COMPAQ BARGAIN

Following on from the Argos gaffe where a TV was offered at £2.99 on its Web site, Compaq has mistakenly advertised a PC model at £1. Over 100 customers ordered the iPaq Legacy Lite at £529 off its usual price. But Compaq has refused to sell the PCs at that price, instead offering the users a free printer – as long as the PC is bought at the full £530. Such matters have not yet been tested in court because the Argos case was dropped before coming to court. Some legal experts say that deals can be binding even if funds have not been exchanged.

#### PC GOES PLUS

Microsoft is finalising the specification for the 2001 PC, something which Bill Gates has termed 'PC Plus' – the writ's in the post, Bill. But the industry is already criticising the company for designing the platform around bloatware software. Critics have said the new breed of PCs will be more difficult to manage because they will be over-specified for business requirements. Although the draft specification calls for 128MB of memory, a 500MHz processor and DVD drive, the final version is likely to require significantly more.

## Whiteboard presentations go on-line

*Mimio boardCast means an end to missed lectures*

**H**ad it not been for the date, a story about the mixing of ink, wireless technology and sound might have sounded like an April fool. But the mimio boardCast system from Virtual Ink uses this technique to revolutionise presentations. It enables ink and audio to be e-broadcast on-line. Ink from any mimio whiteboard is synchronised with voice and then streamed over the Internet using software from RealNetworks. Each pen stroke is recorded and up to four colours can be used. The system is



Students have no excuse for missing lecture notes any more.

being marketed for situations where people might want to catch up on a missed business presentation or college lecture. More information can be found at [www.mimio.com](http://www.mimio.com).

## Writers wanted for PC Plus!

*PC Plus is expanding and needs new talent*

**C**ould it be you? We need both freelance talent and new employees. Knowing your stuff is vital but is not enough by itself.

We want genuine enthusiasts, people who are passionate about exploring computer hardware and software, and who can communicate their knowledge and enthusiasm directly to our readers.

Whether you are an existing writer bored of turning out the same old corporate prose for other computer magazines, or are new to professional writing but feel you'd be able to give it a go, drop the editor, Nick Merritt, an e-mail at [nick.merritt@futurenet.co.uk](mailto:nick.merritt@futurenet.co.uk) and we'll take it from there. **So what are you waiting for? Don't delay – you have nothing to lose.**





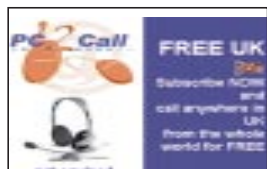
For the latest news, UPDATED DAILY, visit our Web site at [www.pcplus.co.uk](http://www.pcplus.co.uk)

## Now get free voice calls over the Internet

*PC2Call provides free UK phone calls for PC users*

If you've got unmetered Internet access, the next thing to try out is free voice calls. PC2Call ([www.pc2call.com](http://www.pc2call.com)) enables PC Internet users to make free calls to UK landline numbers – from anywhere in the world. Any other types of number can be called for a low fee. No software is required – just Win95 and above, a modern browser and a duplex sound card.

After registration, the destination telephone number is entered on a keypad on the Web site and the call should be



Phone bills might soon be a thing of the past.

made. The number is the country code and then the full number, without any leading zero. It's recommended to use a headset to avoid any feedback or echo. There is no limit on the number of calls or the duration of an individual call. The service currently supports calls to 250 countries.

## Boo.com goes bang

*As analysts warn that most dot com e-tailers may not survive*

Following a series of reports predicting tough times ahead for many of the dot com startups, the high profile fashion e-tailer Boo.com went bust, after failing to secure new finance. It had previously been hoped to float the company on the stock market, but plans were abandoned after the poor performance seen in hi-tech stocks following the flotation of Lastminute.com. Boo.com suffered problems from the word go – including a very late Web site, technology that many PCs couldn't cope with, palatial London offices and high staff salaries.

And in common with most other on-line sellers, Buy.com – 'The Internet Superstore' – posted large first quarter losses for this year. The service lost nearly \$33 million on a turnover of \$207 million – compared with a loss of \$19 million in the same quarter last year. But higher gross margins give the company cause to be optimistic.

The failure of Boo.com came straight after a gloomy e-commerce report from PricewaterhouseCoopers. This suggested that one in four

Internet companies could run out of money within six months – and that most could be broke within 15 months. Most financial analysts agree that on-line sellers are not immune from the basic economics of 'sales minus expenses equals profits'. But money is still entering the hi-tech sector.

ThinkNatural.com – Europe's first and largest natural health and body care Web site has announced a further £10 million of funding.



Boo.com – not as successful as other Swedish exports such as Abba and Volvo.

### LINUX NEWS

#### WINDOWS OPENS ON LINUX

Linux users wanting to retain their Win95/98 applications might be interested in VMware Express for Linux. This enables the Microsoft operating system to be run in a VMware virtual machine on top of a Linux host. And the supplied Samba utility enables files to be shared between the two environments. The product will only be sold through VMware Inc's partners so it will not be available for download. More information can be found at [www.vmware.com](http://www.vmware.com).

#### DRIVECOPY 3.0

Powerquest has announced DriveCopy 3, the aptly-named utility for making exact copies of hard disks for hardware upgrades and transfers. The new version includes support for Linux Ext2 file systems and Linux swap files, as well as Win2000 Professional. The previous drive limit of 8.4GB has also been removed. The company's Web site is at [www.powerquest.com](http://www.powerquest.com).

#### LINUX TRAILS NT IN BUG STAKES – JUST

A recent survey by SecurityFocus has shown that WinNT only has marginally more security bugs than Linux – despite their differing reputations for reliability. At the time of the report's publication, 34 vulnerabilities had surfaced in WinNT this year, with 30 in Linux. More information is at [www.security-focus.com](http://www.security-focus.com).

#### IBM WINS RED HAT TRAINING CONTRACT

IBM has signed an agreement with Red Hat to deliver Linux training, including the Red Hat Certified Engineer (RHCE) programme. IBM is the largest provider of IT training and the new Red Hat training will be carried out at IBM training centres throughout the world. More information can be found at [www.ibm.com/services/learning/spotlight/linux.html](http://www.ibm.com/services/learning/spotlight/linux.html).

## UK unmetered Internet takes off

*But users experience engaged tones and poor performance*

AltaVista has been dismayed at the number of companies offering unmetered Internet access before its service even got off the ground. RedHotAnt launched a service at £30 and then £20 a year for unmetered access at any time. Sessions were restricted to a maximum of three hours and disconnection took place after ten minutes of inactivity. But users were quick to complain about performance and engaged tones and many messages appeared in ISP newsgroups. Hackers also defaced the service's front page.

The annual price was soon raised to £40 and a delay was put on new accounts being activated. At the time of writing, the service had significantly improved. LineOne also became a victim of its own success and temporarily



RedHotAnt – put a stop on new accounts until problems were sorted out.

stopped taking on new users. And a high profile campaign for [www.thefreeinternet.net](http://www.thefreeinternet.net) has been running on TV – complete with the enthusiastic voice of Chris Tarrant. This offers a similar deal to RedHotAnt with the first year's unmetered service costing £50.

All of this has meant established players have had something of a wake up call. For example, Freeserve is now offering three ways of connecting to its service. No Ties is the existing method where the user solely pays for their calls. Off-Peak provides free access between 6:00pm and 8:00am and all day at weekends for £6.99 a month. And Unlimited provides free access at all times, for £10 a month or when £10 is spent on national or international calls on the Freeserve network.

All of this can only benefit UK Internet users. But, once again, BT is offering some of the most expensive options. The off-peak BT Internet service costs £9.99 a month and the SurfTime package is significantly more. But it remains to be seen whether freephone Internet access can provide a satisfactory service in the long term.





# Napster sued by Metallica

## MP3 in the dock again

**T**he recording industry believes the MP3 format poses a threat to future revenues – and therefore new acts. As well as the legal action ongoing against several MP3 Web services, the managers of US band, Metallica, are suing the authors of Napster for breaching copyright and handling 'stolen goods'. Rap act, Dr Dre, joined in the action and other artists are expected to follow suit.

Napster – [www.napster.com](http://www.napster.com) – offers a downloadable software utility which lets you share MP3 files with people around the world. In order to get around piracy laws, music files are never stored on the Web site; instead, the Napster software acts as a middleman, keeping records of files on individual users' machines. Search for Moby, for example, and Napster will list all machines with Moby tracks on them. If you want to download a song, the software hooks up to the other person's machine and automatically copies the music to your PC.

Metallica has blocked 330,000 Napster users – a figure which came after the service was monitored over a weekend. But users were surprised at an apparent lack of privacy in their use of Napster. After representations were made by the Slashdot Web site, the band agreed to answer questions through its publicist. After a two week wait, no answers had been received from the band.

Action had also been threatened against US universities such as Harvard and Yale. The threats were only withdrawn after Napster users were banned from their internal networks. The Napster case joins the others being heard in the US courts. One of the key arguments seems to be whether the US Digital Millennium Copyright Act and Audio Home Recording Act are applicable to Internet music distribution. Metallica could have waited on the outcome of current legal battles. Instead, they've elected to pursue their own case against Napster. The outcome will have a significant affect on the Internet music business.

The band aims to prove that Napster has no right to distribute its works.



## NEWS IN BRIEF

### INTERNET NEWS

#### COOKIE MONSTER STRIKES IE

The [peacefire.org](http://peacefire.org) Web site has reported on an Internet Explorer security flaw that enables a Web site to read any of cookies stored on a user's PC. The browser normally only enables cookies to be read from within the originator's domain, but using a malformed URL, a malicious site can read any cookie. The [peacefire.org](http://peacefire.org) site includes an on-line demonstration. With the move to e-commerce, cookies are becoming more and more important and yet their security is increasingly brought into question. Microsoft has issued a security bulletin and patch for this problem at [www.microsoft.com/technet/security/bulletin/ms00-033.asp](http://www.microsoft.com/technet/security/bulletin/ms00-033.asp).

#### WAP FAILS USERS

Although the Wireless Application Protocol (WAP) had stock markets excited a few months ago, users have been busy creating their own definition for the acronym. And this widespread scepticism could be justified. [AnywhereYouGo.com](http://AnywhereYouGo.com) recently conducted tests on 50 Wap-enabled Web sites and it found that more than a quarter had errors serious enough to prevent users from displaying pages or completing their transactions.

#### PRODUCT RECALL

MAXDATA has issued a product recall on its Belinea 10 70 50 17-inch monitor. This was sold between 1997 and 1999 and an incorrect component could lead to a reduced life span. The company is recalling the monitors and will repair them free of charge. Users with this model can register on-line at <http://107050.belinea.com>. The serial number will be required and this can be found on the rating plate at the rear. The MAXDATA helpline telephone number is 0800 169257.

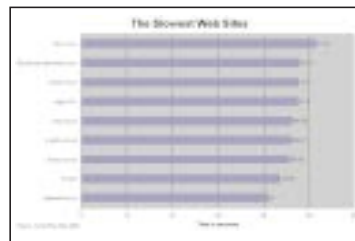
# Slow Web sites drive shoppers away

CacheFlow study shows a threat to UK e-commerce

**A**lthough the UK is aiming to be a world leader when it comes to e-commerce, a new study shows that download speeds are in danger of driving users away. CacheFlow, the Internet caching appliance provider, found the average waiting time for a site to download is 28 seconds.

Yahoo! was the slowest search engine at 47.7 seconds, AltaVista was slightly better at 31.7 seconds, Excite took just 8.4 seconds and Lycos came in at 8.3 seconds.

CacheFlow concluded that eight of the ten fastest sites are ones that have been Web-based from the start – such as Excite, Lycos and Bol.com. In contrast, six of the ten slowest sites complement existing non-Internet services. The chart below shows the slowest Web sites in the CacheFlow study.



More than half of the slowest sites are ones that complement existing non-Internet businesses.

JULY – AUGUST 2000

## Upcoming events

Get yourself to this month's computing and IT events

Date: 4-7th July  
Event: Microsoft Tech Ed 2000  
Venue: RAI Centre, Amsterdam  
Contact: [www.microsoft.com/europe/teched](http://www.microsoft.com/europe/teched)

Date: 10th July  
Event: Brands@internet  
Venue: Knightsbridge Millennium Hotel, London  
Contact: [www.ibc-uk.com](http://www.ibc-uk.com)

Date: 11-12th July  
Event: IP Access Networks  
Venue: Dorchester Hotel, London  
Contact: [www.ibctelecoms.com](http://www.ibctelecoms.com)

Date: 12th July  
Event: Data and Document Capture 2000  
Venue: University of Hertfordshire  
Contact: [www.cimtech.co.uk](http://www.cimtech.co.uk)

Date: 13th July  
Event: Broadband Access Strategies for the 2000s  
Venue: London  
Contact: [www.ibctelecoms.com](http://www.ibctelecoms.com)

Date: 1st August  
Event: ICE (Internet Commerce Expo)  
Venue: Manila

Date: 10-11th August  
Event: Using the Internet as an effective Competitive Intelligence tool  
Venue: Cyberia Cafe, London  
Contact: [www.inconference.co.uk/conf3.htm](http://www.inconference.co.uk/conf3.htm)

Date: 14-18th August  
Event: IT Law Summer School  
Venue: Downing College, Cambridge  
Contact: [www.ibc-uk.com/c11182/?source=tsc11182](http://www.ibc-uk.com/c11182/?source=tsc11182)

Date: 20-24th August  
Event: Computer Training World  
Venue: San Francisco  
Contact: [www.influent.com](http://www.influent.com)

Date: 30 August-3 September  
Event: CeBIT Home  
Venue: Leipzig, Germany  
Contact: [www.cebithome.de](http://www.cebithome.de)

Readers are advised to pre-register and check with organisers

# Building a Newsgroup Reader With C++ Builder 4.0

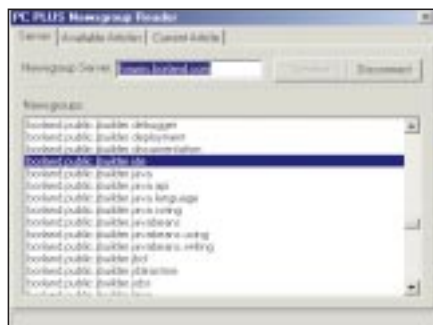
In this concluding part of our Internet tutorial, Dave Jewell shows you just how easy it is to build a newsgroup reader



**T**his month concludes our three part tutorial on Internet programming. We'd originally planned to write a simple newsgroup reader using WinShoes, the free internet component. But with the Professional version of C++ Builder 4.0 on this month's *SuperDisc*, we can forget about WinShoes and use the Internet components built into the development system.

We're not saying that these tools are necessarily better or worse than WinShoes, but by using what's already supplied, we can forget about the sort of configuration issues that one or two readers have experienced in getting WinShoes installed under C++ Builder. By using the components on the 'Internet' tab of your

When you run this month's Newsgroup reader program, you must first specify the name of a newsgroup server and then hit the Connect button. All being well, you should be rewarded with a list of available newsgroups, like this.



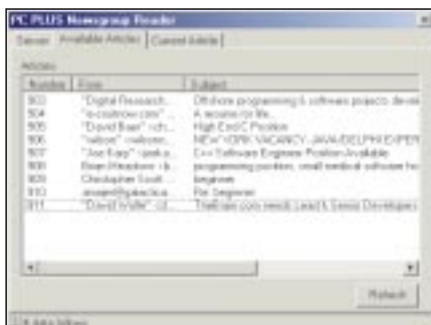
Component Palette, everything should work right out of the box.

The program we've developed here is based on one of Borland's sample applications, NNTPDEMO, which you can find in the EXAMPLES\INTERNET\NNTP directory after installing C++ Builder. However, we've made quite a number of changes to the program including stripping out some of the more confusing features and cleaning up the code and user interface.

## Using the Program

Our newsgroup reader is made up of a tabbed dialog of three separate pages. On the first page, you enter the name of the newsgroup server

Double-click a likely-looking newsgroup and you'll be taken to the second page of the dialog and presented with a list of available messages in that particular newsgroup. If you remain logged on for a long time, you can use the Refresh button to update the message list.



that you want to access and then press the Connect button. Assuming that everything has gone okay, the cursor should change to an hourglass and after a few seconds a list of available newsgroups will appear in the list box.

Be warned that some servers carry a vast number of newsgroups – as in 10 or 20 thousand! If you try connecting to one of these servers, you may have to wait quite a while before the entire list of newsgroups has been retrieved. For the purposes of testing, our newsgroup reader defaults to **forums.borland.com**, which carries a reasonable number of different newsgroups relevant to programmers who are using Borland products. But also try pointing it at **nnntp.futurenet.com**, home of the PC Plus C++ newsgroup **pcplus.dev.cpp**.

Once you've got a list of newsgroups, and the cursor has reverted to normal, you can double-click any newsgroup that takes your fancy. The program will automatically download the message headers for that newsgroup (if you don't understand what this means, read NNTP and Newsgroups – An Introduction) and transfer you to the second page of the tabbed dialog.

You'll see the message number, an indication of who the message is from, and the subject of that message. Some newsgroups are very busy, with new messages being posted all the time. In order to cater for this, we've

## NEWSGROUPS EXPLAINED

# An Introduction to NNTP and Newsgroups

All you need to know about how to post and receive messages

**N**TP, as you've probably gathered, is the 'Net News Transfer Protocol' used to post and receive messages from Internet Newsgroup servers. The protocol is designed in such a way that you can download the smaller, header information for a message before downloading the body itself. This makes it possible for client-side programs, such as our newsgroup reader, to accumulate a list of all the messages in a particular newsgroup without having to download all the message bodies.

Just retrieving headers becomes especially

important when working with certain newsgroups in which the participants routinely upload large binary attachments as part of a message. There are many newsgroups whose only function is to serve as a means of distributing large binary files.

Many newsgroup servers are so busy that it's not practical to store each and every message that was ever posted. Such servers are generally configured so as to automatically throw away older messages as new ones are added. This means that if you're very interested in a particular newsgroup, the onus is on you to keep up – if you

don't connect for a few days, you're likely to miss out. A good place for catching up with missed newsgroup messages is [www.dejanews.com](http://www.dejanews.com), a massive repository of newsgroup traffic.

If you want to start posting to newsgroups, then you can check out the original Borland project for details on how to post a message, and then add the necessary code to the project. Be warned, however, that newsgroups tend to be a rather beginner-hostile environment! It's best to learn the rules of the game by watching from the sidelines if you don't want to risk getting publicly flamed!

added a 'Refresh' button so that you can ensure the current list of messages remains up to date. If you double-click a message, you'll be taken to the third dialog page where you can see the message header, together with the text of the message itself.

If you compare this program to the Borland original, you'll see that we've removed the ability to log on to newsgroups which require a user ID and authenticated password. We've also taken out the facility for downloading any attachments to a message, and finally we've axed the code for posting messages to newsgroups – which Borland apparently hadn't finished anyway. Nevertheless, as it stands, this is a worthwhile little program which you can take as a starting point and modify to suit your own requirements.

## CODE CORNER

### It's easy to get connected

Just use this simple code

#### Connect

```
void __fastcall
TForm1::ConnectBtnClick(TObject
*Sender)
{
    Screen->Cursor = crHourGlass;
    NMNNTP1->ReportLevel =
    Status_Basic;
    NMNNTP1->Timeout = 60000;
    NMNNTP1->Host = Edit1->Text;
    NMNNTP1->ParseAttachments =
    false;
    NMNNTP1->Connect();
}
```

#### GetMessage

```
void __fastcall
TForm1::NMNNTP1HeaderList(TObject
*Sender)
{
    TListItem * item = ArticleNum->
    Items->Add();
    item->Caption = IntToStr
    (NMNNTP1->HeaderRecord
    >PrArticleId);
    item->SubItems->Add (NMNNTP1
    >HeaderRecord->PrFromAddress);
    item->SubItems->Add (NMNNTP1
    >HeaderRecord->PrSubject);
}
```

#### GetArticle

```
void __fastcall
TForm1::ArticleNumDbClick
(TObject *Sender)
{
    TListItem * item = ArticleNum->
    Selected;
    if (item != NULL) {
        NMNNTP1->GetArticle (StrToInt
        (item->Caption));
        PageControl1->ActivePage =
        CurrentArticleSheet;
    }
}
```

## Explaining the code...

Okay, let's dig in and see how it all works. The newsgroup reader program is based around a TNMNNTP component – one of the NetMasters Internet components which you'll find on the C++ Builder 4.0 palette. When you study this component, you'll see that it implements a large number of events, many of which are crucial to the operation of the code. For example, look at the Connect code fragment in this month's *Code corner*.

This event handler is invoked when the user clicks the Connect button. It sets the cursor to an hourglass, designates a timeout of 60,000 (one minute) and passes the selected NNTP server name to the Host property of the newsgroup component. Finally, it calls the Connect method to actually connect to the server. You'll notice a property assignment here called ReportLevel – this controls how much progress information is reported back to the application via the OnStatus event handler.

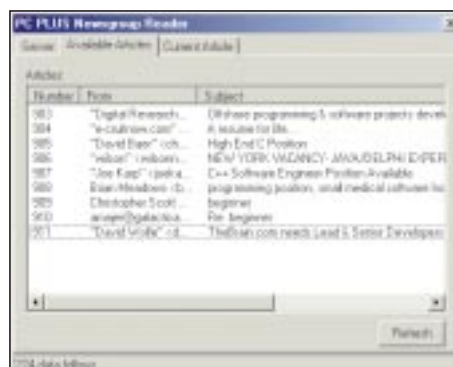
Once the component has connected, an OnConnect event will be generated, causing the NMNNTP1Connect method to be called. This will disable the Connect button, enable the Disconnect button and call the GetGroupList on the newsgroup component to retrieve a list of available groups.

When you double-click a group name, this causes the ListBox2DbClick method to be called. This in turn invokes the NNTP component's SetGroup method which effectively 'points' our connection at the specified group. This, in turn, has the effect of calling the component's GetArticleList method.

In Borland's original demo program, they used a TMemo component to store the list of messages in each newsgroup. This made for a very messy result. We've drastically improved the user interface by using a TListView component, operating in report mode. This enables us to use resizable columns for the message number, sender, and subject fields as you can see in the picture above. Implementing this is easy – when the GetArticleList method is called, it generates an OnHeaderList event for every message that's retrieved from the newsgroup server. This event is fielded by the GetMessage snippet see *Code corner*.

As you can see, every time an event is generated, the HeaderRecord field of the NNTP component contains a new message description. We create a new TListItem each time round the loop, setting the Caption property of the item to the message number of the current message. At the same time, the name of the sender and the message subject strings are also retrieved and put into the SubItems array as part of the new TListView item.

If you wanted to show additional fields within the list view window, you might want to take a look at the documentation for the HeaderRecord data structure. It contains other items such as the date/time when the message was posted, the distribution list (that is, the comma-delimited list of newsgroups to which the message was sent) and more. If you're feeling really adventurous, you might want to



Double-click a message and you'll see the third page of the dialog box where you can read the full text of the posted newsgroup message.

try your hand at sorting all this information on a per-column basis.

The final code snippet in Code Corner is the ArticleNumDbClick method. This is called when a particular message gets clicked on in the message list. The event handler retrieves a pointer to the list view item corresponding to the currently selected message and then retrieves the message number from the Caption property. This is then passed to the GetArticle method of the NNTP component and the program moves the page control on to the third page of the tabbed dialog.

Invoking the GetArticle method causes the NNTP component to generate an OnArticle event when the article has been retrieved. This is fielded by another method called NMNNTP1Article which simply copies the text from the Header and Body properties of the component and pastes it into the relevant TMemo components on the last page of the dialog. Note that the component also exports two other methods – GetArticleHeader, GetArticleBody – used when you want to retrieve just the body or header but not both.

The full source code to our newsgroup reader program is included on this month's *SuperDisc*. Because we're using one of the NetMasters components that comes with C++ Builder 4.0 Professional, you won't be able to load this project into C++ Builder if you're still running the Desktop edition.

Bear in mind that in order to reduce disk space requirements, the supplied executable, NNTPDemo.EXE, has been built with run-time package support. Again, this means that you must have C++ Builder 4.0 installed on your PC before running the executable. If you were shipping a commercial application to customers, you'd generally build your EXE files without run-time package support. The standalone executable will then run anywhere. **PCP**

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Discuss this article on-line at

[www.pcplus.co.uk/forum\\_devcpp.asp](http://www.pcplus.co.uk/forum_devcpp.asp)

## NEXT MONTH

Dave extends the C++ Builder interface with IDE addons.



# Porting programs to Delphi



*The adventure continues as  
Huw Collingbourne ports a Java game to Delphi*



**I**t is a truth universally acknowledged that the Text Adventure is the pinnacle of the programmer's art. The first program I ever wrote of any real complexity was an adventure called The Golden Wombat Of Destiny.

The Golden Wombat was a DOS-based program written in Delphi's ancient ancestor, Turbo Pascal 3. It took me a year to complete and, in the course of writing it, I made just every programming blunder possible. I taught me a lot about how not to program!

This month I've decided to return to the art of the adventure game. I am hoping that the approximately 15 years of programming experience I've had since writing the Golden Wombat will help me make a better job of it this time. It is handy that Delphi, unlike Turbo Pascal 3, provides object orientated programming (OOP) extensions. I am not convinced that OOP is invariably superior to non-OOP coding. However, in an adventure game – where the treasures, the player and the various Rooms can be naturally represented as Objects – it is just about ideal.

## The game's afoot!

A couple of years ago, I wrote a Java adventure game system in the *PC Plus Java Workshop* column. I don't particularly want to start from scratch all over again in Delphi. So I've decided to save some time and effort by translating as much Java code as possible into Delphi's Object Pascal. Last month we looked at some of the issues involved in translating code from other languages. If you aren't familiar with Java, you

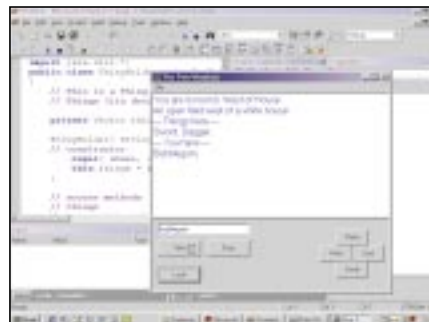


The Java code is too complex to convert in one sitting. Here we define the classes needed for rooms and treasures.

may want to read that article before getting to grips with this month's project.

My Java project is not a complete game so don't expect to have fun playing it. Instead, it provides most of the essential code for creating a game of your own. In particular, it defines all the classes for creating a player, treasures and a map of rooms. The Room and Player classes can each contain lists of other objects. Methods are defined for transferring objects between a Room and a Player. This makes it possible for the player to pick up an object in one location, move to another location and then drop it.

Finally, there are all the classes and methods needed to save and restore a game. When a game is saved, the entire state of all the objects is saved with it. This means that when a game is reloaded, the player and all the treasures are put back into



This project started life in another language. This shows the simple Java adventure game system running in Microsoft's Visual J++ 6.

the rooms in which they were located at the time of saving the game. Before starting on the Delphi version, try the original Java system by running `wombat.exe` in the `\javawombat` directory.

I don't intend to code the saving and loading routines this month. Nevertheless, I need to plan ahead to ensure that these routines will be relatively easy to code. One of the fundamental mistakes I made in my first adventure game was to code the game saving routines after I'd already written the game itself. By that stage, my existing code had blithely scattered lists of objects (in TP3 they were actually Pascal records) all over the place. It was horrendously difficult to find a way of saving them to disk in a single operation. That's one mistake I don't plan to make again.

The Java language provides a very simple way of 'streaming' objects to a disk file. Delphi also has

## KEEP IT OOP

### Object oriented programming

*Limit access to your objects' private parts and avoid embarrassing bugs*

**I**n pure OOP languages, such as Smalltalk, the data fields inside an object are hidden and can only be accessed via clearly defined interface procedures called 'methods'. Languages such as C++, Java and Delphi do not enforce data hiding. However, since data-hiding can help to avoid subtle bugs, I have decided to take a fairly pure approach to the OOP in this project.

Compare the Delphi version of the Java Thing class, which is called

ThingOb, and is found in the `advobjs.pas` unit. Switch to this unit using the Project Manager, from the View menu. As in the Java original, the Delphi class defines 'get' and 'set' methods for each data field. For example, the `getname` function returns the string data from the name field. The `setname` procedure assigns a new value to the name field.

These access methods are placed beneath the public keyword so they are visible to code in other units. The data

fields themselves, however, are placed beneath the private keyword so they are not visible. Turn to the `wombatmain` unit and find the `CheckObBtnClick()` method. This displays the name of a ThingOb object called `aThing` using the `getname` method in this way:

```
aThing.getname
```

Try editing this to access the name field directly:

```
aThing.name
```

When you compile the project, Delphi complains that name is an undeclared identifier. Switch back to the `advobjs` unit and comment out the private keyword. Now when you can compile the project, Delphi does not complain. But this is not what we want. It is a deliberate design decision to enforce code-hiding. So uncomment the private keyword. This ensures that the only way to get 'into' an object is via its data access methods.



## CODE CORNER

# Translation games

Although they look different, Java's *Thing* class and Delphi's *ThingOb* class accomplish exactly the same tasks

## The complete code of the Java *Thing* class

```
public class Thing extends java.lang.Object
    implements java.io.Serializable
{
    private String name;
    private String description;

    Thing( String aName, String aDescription ) {
        // a Thing class constructor
        this.name = aName;
        this.description = aDescription;
    }

    String getName() {
        return name;
    }

    void setName(String aName) {
        this.name = aName;
    }

    String getDescription() {
        return description;
    }
}
```

```
}

void setDescription(String aDescription) {
    this.description = aDescription;
}
}
```

## The definition of Delphi's *ThingOb* class. The code of the methods is found in the implementation section

```
ThingOb = class(TObject)
private
    name : shstr;
    description : shstr;
public
    constructor Create( aName, aDescription : shstr );
    destructor Destroy; override;
    function getName : shstr;
    procedure setName( aName : shstr );
    function getdesc : shstr;
    procedure setdesc ( aDescription : shstr );
end;
```

streaming. While this is by no means as easy to use as the Java equivalent, it is probably the best way to save lists of mixed types of object. Delphi's streaming is intended for use with objects rather than records. So as long I make sure that everything is an object I know that I shall be able to implement streaming later.

## The thing and I

Let's see how to make a start on a Delphi version of the adventure system. Load up the *wombat.dpr* project. You will see that I have recreated the essential features of the user interface including various buttons and a RichEdit display area called *displayBox*. Most of the buttons don't do anything. I'll add the event-handling code later.

The first important task to tackle is the definition of appropriate classes from which the objects in the game can be derived. In the Java version, each class has its own separate file. The basic class from which other classes, such as *Room* and *Person*, descend is called *Thing*. Load *Thing.java* into Notepad to see its definition.

Now load the *wombat2.dpr* project. Use the Project Manager to view the *advobs2* unit. This defines a descendant of *ThingOb* called *ThingHolderOb*, which includes a *TList* object called *Things*. Delphi's *TList* is a list management class that can contain mixed object types. It's the closest equivalent of the *Vector* class used in the Java project. The *ThingHolderOb* class will, in due course, become the parent of the *Room* and *Person* classes, each of which needs to be able to own a list of objects.

Note that every class defines two special methods – a constructor called *Create* and a destructor called *Destroy*. Find the implementation of *ThingOb.Create* in the *advobs2* unit. The constructor takes care of

allocating memory for a new object and initialising its internal data. It does this by first calling its ancestor's constructor using the keyword *inherited* as follows:

```
inherited Create;
```

Having done this, it initialises its own fields:

```
name := aName;
description := aDescription;
```

In Java, a constructor is a method with the same name as the class. There is an example of this in *Code corner*. In Delphi, a constructor can have any name as long as it is declared with the keyword *constructor*. My code sticks to the convention of naming the constructor *Create*.

## I'm free!

Unlike Java, every object created in Delphi must be explicitly destroyed using a destructor. Normally the destructor is named *Destroy*.

In Delphi, you should normally call *Free* rather than *Destroy* when you want to deallocate an object's memory. *Destroy* will cause an error if it is called when an object variable is set to nil; the *Free* method checks for a nil value before attempting to *Destroy* an object.

Notice that the *Destroy* method is declared using the *override* keyword in the *advobs2* unit. *Destroy* is a 'virtual' method. A virtual method declared in an ancestor class can be redefined by a method with the same name plus the *override* directive in a descendant class. When an ancestor's method (such as *Free*) calls an overridden method (such as *Destroy*) the appropriate overridden method is executed.

Let's see how this works. Assume we have two

classes, *Parent* and *Child*, where *Child* is a descendant of *Parent*. A *Child* Object is compatible with a *Parent* object. Therefore it is possible to write a procedure that takes an argument of the *Parent* type. When the program is run, the procedure could, in some instances be passed a *Parent* variable and in other instances it could be passed a *Child* variable. It has to be able to handle both correctly.

In such a procedure, a *Child* variable, *X*, may call a *Parent* class' *Free* method. The *Free* method now calls *Destroy*. If *Destroy* were not overridden, the *Parent* class' *Destroy* method would execute and this would not correctly deallocate the *Child* object's memory. But if *Destroy* is overridden, when the *Parent*'s *Free* method executes, the call to *Destroy* locates the correct version of the *Destroy* method for the current object. In the present case, this means it would call the *Child* class' *Destroy* method – and this will correctly deallocate the *Child* object's memory.

When declaring a *Destroy* destructor, it is obligatory to add the *override* directive. When you declare any other methods with the same name as methods in an ancestor class, it is up to you to decide whether or not they should be virtual and overridden methods. This is often a tricky and potentially bug-ridden task and we shall return to this subject in later columns. **PCP**

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[www.pcpplus.co.uk/forum\\_devdelphi.asp](http://www.pcpplus.co.uk/forum_devdelphi.asp)

## NEXT MONTH

Huw continues his quest for the perfect port.

# How to build a JSP Message Board



*You've no doubt seen threaded discussions on the Web before. This month, David Griffiths shows you how make them using Java Server Pages*

**L**ast month we went through the basics of how Java Server Pages work and how to use them. This month, we'll develop a full-blown JSP message board application from scratch.

JSP applications are usually built in two parts: JSP pages are used to define the look and feel of the application and Javabeans are used to store the more complicated server programming. The idea is that the development can be split between two distinct groups of people. On the one hand, programmers can take a set of business rules and turn them into chunks of code that are easy-to-use. On the other hand, page designers can insert little bits of code into their pages and concentrate more on the way the application appears to the user.

## The example application

On the *SuperDisc* this month you will find the code for the example application. It is a simple message board system that was written and tested on the Apache Jakarta reference server, but it should work on any JSP enabled Web server.

The Javabeans that form the bulk of the server code are in a package called `com.spigots.cafe`.

## Storage

The 'cafe' package creates and manages Message objects, which are stored as files on the server's disk. Each message board is allocated its own directory on the hard disk, and every message will be saved as a separate file within this directory. A message is given a unique ID, which matches its filename. For instance, message with ID '9\_1' will be stored in the file called '9\_1.msg' and so on.

Some messages will be brand new postings to the bulletin board, whereas others will be responses to other messages. For this reason each Message object needs to keep a list of its replies, stored as a Vector of message IDs. We can generate IDs for replies based upon the ID of the original message. So, for instance, a message with ID '7' will have replies marked as '7\_0', '7\_1', '7\_2' and so on.

The bulletin board will have a special message stored in the directory called the 'root' message. This is always given the ID '0', and all 'new' messages (that is, ones which aren't simply replies to other messages) are stored as if they were replies to the root message. Root messages will be automatically created the first

time they are accessed. This means you don't have to do anything to create a new bulletin board, just point a JSP page to an empty directory and it will automatically set itself up.

## Server applications

Client applications – like applets – only need to work for one person at a time. Server applications have to provide a consistent set of data to lots of users simultaneously. In the case of a bulletin board system, this might not seem too complicated. If we are storing all of the messages in their own disk files, then everyone should automatically have the same set of data. Right?

Wrong. Imagine two people decide to reply to a message at the same time. The server will load up a copy of the message for each user, who will then post a reply to it and save it back to the disk. Each user will have a different version of the same message, each with only their reply recorded in it. Whoever is the first to save to disk will find that their reply disappears as soon as the second person saves their own copy of the message.

We can't lock the message objects and hope that this will solve the problem because there are two distinct objects, even though they have been created from the same message file.

## Using a cache

We can get around the problem by introducing another class called MessageManager that will make sure there can never be two objects created from a single message file at the same time.

It does this by using a special collection of messages called a cache. You can see how the cache works in *Cache flow*.

## Accessing messages

Open the 'cafe1.jsp' from the Workshop Files on the *SuperDisc* in FrontPage Express or Notebook or another text editor and look at the following section:

```
MessageManager messageManager =
MessageManager.getInstance();
if (currentMsg.equals(""))
    msgMain = messageManager.
fetchRoot Message (ms Path);
else
    msgMain = messageManager.
fetchMessage(msgPath, currentMsg);
```



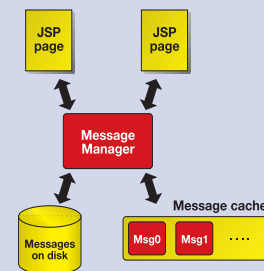
SEE OUR **SUPERDISC**

PATH: \handson\files\java

## CODE CORNER

### Cache flow

*Stay on-message with message manager*



**T**o make sure the bulletin board works properly we have to prevent users loading up multiple copies of a message from disk. We can prevent this by only accessing the messages through a special class called MessageManager.

When the Java Server Page requests a message, the message manager checks to see if it is already in its cache, and if so it returns the cached message. If not, it creates a new message from the message file, stores it in the cache and then returns it to the user.

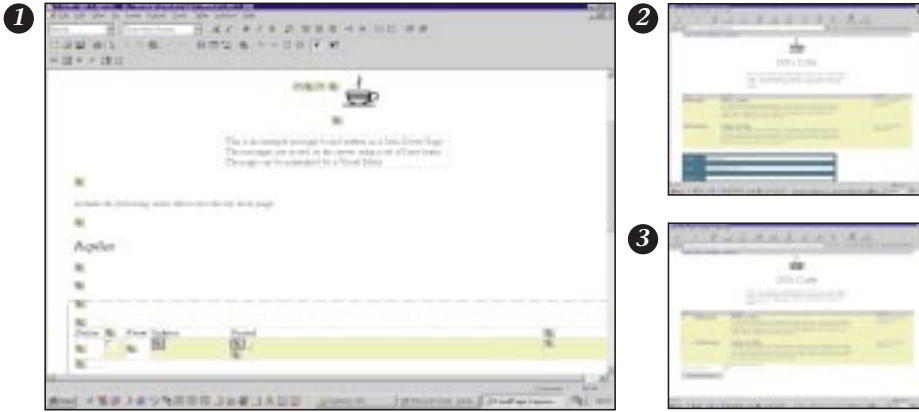
In this way, if two users try to access the same message at the same time: the first will cause a new message to be loaded into the cache; the second user will simply be given this cached message. Each user will then have a Message that points to the same object in memory. So any changes made by one will be instantly visible to the other.

As well as improving the consistency of the program, it should also improve its performance. In general, people will read more than they will post, and so by storing the messages in a cache we can avoid making unnecessary accesses to the disk.

First of all we need to get an instance of the MessageManager object. Because there is only one of these, we need to get access to it using the 'getInstance' method rather than by creating our own.

We can then use the manager to retrieve a message. Here currentMsg is a





1 Here we can see the example page first of all being edited through FrontPage express. Using a GUI tool we are able to add fancy HTML tricks like DHTML and behaviors to make the page easier to use. In the example extra code has been added to the page so that newer browsers will be able to sort the messages by name, subject and time of posting.

2 This is the page as it appears viewed through a Web server.

3 With very little recoding we can use the same page to remove unwanted messages from the bulletin board.



String containing the ID of the message we want to display and path is the name of the directory where it is stored. If currentMsg is blank, we look up the root message for the directory, otherwise we get a message with the appropriate ID.

Later on in the page, you will find the code that posts a reply to msgMain:

```
Message msgNew = new Message();
...
msgMain.addMessage(msgNew);
```

The 'addMessage' method will store the ID of our new message in the list of replies within the msgMain object, and it will then save both msgMain and msgNew back to disk.

## How the page works

The page works by repeatedly calling itself with different sets of parameters. Parameters are passed to the page either as part of the address (by adding a question mark and some extra symbols at the end) or by POSTing values to the page from an HTML form. The first time you open it, it will probably be with a URL something like this:

```
http://127.0.0.1/jsp/cafel.jsp
```

The actual address will vary depending upon what server you use. This contains no parameters. If, instead, we were to type the following:

```
http://127.0.0.1/jsp/cafel.jsp?
admn=1
```

the page will now switch to administration mode and allow you to remove messages.

Within the code the page is able to pick up parameters using getParameter:

```
boolean isAdmin = false;
if (request.getParameter("admin")
!= null)
    isAdmin = true;
```

This code converts the existence of the parameter into a boolean variable that we can use later on in the page to switch different sections on or off:

```
<% if (isAdmin) { %>
<h1>In admin mode</h1>
<% } else { %>
```

```
<h1>Not in admin mode</h1>
<% } %>
```

By analysing the parameters passed to it, the page is able to perform a number of functions.

## Displaying the front page

If you call the page with no parameters, you see the front page of the bulletin board and the list of messages. Within the code, the 'isAdmin' variable will be set to false, the parentId variable will be null and 'msgMain' will point to the root message. The page will display the command menu, the title and introduction to the bulletin, the list of messages and the new message form.

## Display a message

If we pass a 'currentmsg' parameter to the page, this message will be displayed:

```
http://127.0.0.1/jsp/cafel.jsp?
currentmsg=0_3
```

This will list any replies that have been posted to it.

## Post a message

The page will post a new message or reply if there is a parameter called 'text' present. This will happen if you fill in the message form and click the 'Post Message' button. Apart from posting a message, the page will work in exactly the same way as if it was just listing messages or replies.

## Deleting messages

The page also enables you to remove messages and replies. To do this you need to switch to 'admin' mode by clicking on the 'Admin' link at the top of the page. This re-displays the current page, but each message or reply will now have a checkbox next to it. To delete a message you will need to click the checkbox, enter the admin password (in the example this is 'liquorice') and then click the 'Delete Messages' button.

## Making refreshes work

One problem common to bulletin boards (for instance my own at [www.spigots.com/wwwboard.html](http://www.spigots.com/wwwboard.html)) is that people post new messages but can't see them until they refresh the page. Inexperienced surfers won't realise this and may post the same message time and time again.

It is possible to work around this by adding random characters to the end of the page's address, so the browser will think that it is going to the page for the first time and will load it afresh from the Web server. This is done in the Web server by adding the name of the current request object to all the links. So, instead of seeing:

```
http://127.0.0.1/jsp/cafel.jsp
```

it will appear as:

```
http://127.0.0.1/jsp/cafel.jsp?
request=com.sun.web.core.
HttpServletReuestFacade@9b16437
```

## Configuring the bulletin board

You can configure the application by changing the cafel.jsp page alone. The administration password and the message directory (in the example these are set to 'liquorice' and 'c:\windows\temp') are both listed at the top of the file, and neither of them will be visible to anyone using the page through a Web server.

The layout can be modified through most GUI editors. Make sure that the editor you are using preserves the scriptlet tags and doesn't throw them away as unrecognised HTML. FrontPage will treat them as Active Server Pages tags.

## Adding tag libraries

One big development in the JSP standard is the use of tag libraries. These enable you to remove scriptlet code from the page completely and replace them with much simpler tags, for example you could insert 'admin-mode-only' code with:

```
<cafe:adminonly><h1>I am in admin
mode</cafe:adminonly>
```

This will make life easier for page designers, because they won't need to know any Java code at all. We've not used tag libraries in the example because they are currently only supported by the reference Jakarta server but they should appear in other Java enabled servers soon. **PCP**

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## NEXT MONTH

David Griffiths takes a closer look at Java Server Pages, and looks at how they can enhance your static Web pages.

# How to hook Perl up to a relational database



## PART FOUR

*Charlie Stross digs into a database and starts mining data using Perl*

**P**erl is commonly used for building database-driven Web sites. This month, we're looking at how to hook Perl up to a relational database. We're going to explore a sample CGI guestbook script that sits on top of MySQL and see how it we can get data from a CGI script into a database and back out again.

Perl can talk to a variety of relational database management systems (RDBMS) via a module called DBI (Database Interface). DBI presents a standard API that applications can use to connect to a database server, submit SQL commands and execute queries. DBI provides a uniform interface – in general, you can easily port a Perl database program that uses DBI from one database to another. To do the low-level stuff, DBI relies on a DBD (Database Driver) module; there is a separate DBD module for each supported RDBMS. The job of the DBD module is to accept commands from DBI and

translate them into a call to the underlying RDBMS. In addition, the DBD modules may expose some application-specific functionality to Perl, although using this may compromise portability.

There are DBD drivers for Oracle, Informix, Sybase, Interbase, ODBC, flat CSV files and a whole load of other databases. For this article, we're going to use MySQL ([www.mysql.com](http://www.mysql.com)) from TcX of Norway.

One advantage of DBI is that you can connect to multiple RDBMSs at the same time and interchange data between them. Another advantage is that it makes it easy to build database-driven Web applications like this one, a simple guestbook.

A Web guestbook is the poor cousin to a bulletin board or discussion forum; it's a tool that enables users to write comments and append them to a Web site, and displays a list of



previously added comments. It doesn't do useful things like threading, subjects, discussion areas, and scoring, but it provides the minimal subset of posting an article and reading articles.

Most guestbook CGI scripts simply provide a form and append text uploaded via the form to a flat HTML file. Ours is a bit more sophisticated. Submitted comments are inserted into a database table where they are tagged with some additional information (a timestamp, a unique identification number and a flag to indicate whether or not the comment is 'visible'). When the user looks at the guestbook, only the most recent comments will be displayed and, if the administrator sees a comment they disapprove of, they can set the

### USING THE MYSQL DATABASE

## MySQL and the guestbook database

*Getting to grips with MySQL can be quite complicated...*

**M**YSQL, from TcX DataKonstult AB of Sweden, is free (on UNIX/Linux), with a shareware version for Windows. It provides a lightweight and nearly complete SQL92 implementation, while being small enough to pick up relatively fast. (Unlike, say, Oracle.) You can find it on this month's *SuperDisc*, or download it from <http://sunsite.org.uk/packages/mysql/>.

MySQL is described in detail in the reference manual that comes with the package. (It's on-line at [www.mysql.com/Manual/manual\\_toc.html](http://www.mysql.com/Manual/manual_toc.html).) There is also a book on the subject: *MySQL & mSQL*, by Randy Jay Yarger, George Reese and Tim King (O'Reilly and Associates, ISBN 1-56592-434-7).

There simply isn't enough room in this column to explain how to install MySQL in detail, though Chris Jones will be looking at it next month. However, to run this guestbook script we need to do the following things:

1. Install MySQL and start the server running.
2. As root, create a new database called 'guestbook':

```
mysqladmin create guestbook
```

3. Create a new MySQL user called 'gb'. This user can connect only from localhost, using a

password (set up as 'gb\_password' in the gb.cgi script — you'll need to change this), but has root privileges on the 'guestbook' database. As root, run 'mysql mysql' (that is, fire up the MySQL query monitor, running on the 'mysql' database which stores MySQL's local settings). Type:

```
insert into mysql.user values
('localhost','gb',PASSWORD
('gb_password'),
'Y','Y','Y','Y','Y','Y','Y','Y',
'Y','Y','Y','Y','Y','Y','Y','Y');
```

This sets up a new user called 'gb' with password 'gb\_password'. (You can tinker with these, but if you do you'll need to modify the contents of the hashref \$dbconf in gb.cgi, otherwise the Perl CGI program won't be able to connect to the database using this username and password.)

Once you've set up the user called 'gb', you need to quit the MySQL query monitor and tell the database server to reload its user privileges:

```
mysqladmin flush-privileges
```

4. Now it's time to set up the 'guestbook' database. Actually, it's not a very complex database — one table with five fields. You can do it like this:

```
mysql -u gb -pgb_password
guestbook < gb.sql
```

(Note that we can now do this as user 'gb' by specifying gb's password). gb.sql is simply a text file containing our database's structure:

```
CREATE TABLE gb (
  author varchar(128),
  contents text,
  creation_time datetime,
  visible tinyint(4),
  comment_id int(10) unsigned
DEFAULT '0' NOT NULL
auto_increment,
  KEY comment_id (comment_id)
);
```

5. We should now have a database called 'guestbook', that contains a single table called 'gb', with the structure defined above. We should also have a user called 'gb' who, when connecting from localhost, has full privileges on the 'guestbook' database (but no others).

The final step is to put the gb.cgi script somewhere appropriate (your cgi-bin directory a good start!), make it executable (if necessary editing the #! line), and point a web browser at it.



'visible' field to zero or NULL and the comment will not be shown to visitors. Actually, by simply adding one or more 'topic' or 'subject' fields, we can turn this into the core of a conferencing system. But, for now, we're going to keep things simple.

The program gb.cgi is structured like the mailform.cgi script presented in *PC Plus* 165; the main difference is the addition of DBI database code and a couple of extra service subroutines. There's a user-configurable hashref called \$dbconf at the top; this is where we set up the name of the database and table we'll use to store our guestbook, along with the password and other useful items. Below it, we create a new CGI object called \$q, open a database handle on the database, then hit the main logic of the CGI program:

```
if ($q->param('data') == 1) {
    insert_gb ($q, $dbconf, $d);
    print_gb ($q, $dbconf, $d);
} else {
    print_gb ($q, $dbconf, $d);
    print_form($q);
}
```

The CGI field 'data' (which is hidden in the form printed by print\_form()) contains a '1'. So, if we see it, we're processing input from a form submission. We therefore call insert\_gb() to insert a guestbook record into the database, then call print\_gb() to print an HTML page showing the guestbook contents.

If we don't see a field called 'data', we know that the user has just hit the guestbook script for the first time. So we call print\_gb() to show them the guestbook, then call print\_form() to give them the opportunity to add their comments to it.

insert\_gb() is fairly simple-minded. It takes the form fields from the CGI object and builds an SQL INSERT statement that puts them in the guestbook.gb table. The only non-standard items to note are:

```
my $buffer = sanitise
($cgi->param('contents'));
```

Instead of inserting the 'contents' text area verbatim, we do some mild processing on it. (We don't want malicious users inserting random URLs or bits of javascript into our guestbook, do we?) This is farmed out to a subroutine called sanitise(), which currently doesn't do much, but which can be extended quite easily.

We call the MySQL function CURRENT\_TIMESTAMP() to provide a suitable parameter for the creation\_time field (of type datetime) and we set comment\_id to NULL, forcing MySQL to insert a sequential, auto-incremented number into that field. (We don't use this here, but per-article unique reference numbers are a vital prerequisite for any full-blown



## THE DBI MODULE

# The Perl DBI Interface

Investigating Perl DBI calls...

A Perl program calls:

```
use DBI;
```

to load the DBI module. Before this will work, you need to install the latest version of DBI (available from CPAN – [www.perl.com/CPAN/](http://www.perl.com/CPAN/)) and an appropriate DBD drivers for relational databases you're going to use (also available from CPAN).

A DBI session typically starts by calling the connect() method with a bunch of parameters which vary from database to database (the details are in the documentation for each DBD driver). This tells DBI to load the correct DBD driver, establish a connection to the RDBMS engine and return a database handle. The database handle is actually a DBI object and provides methods for talking to the database we're connected to. For example:

```
my $dbh = DBI
->connect("DBI:mysql:database=
guestbook;host=localhost",
"guestbookuser",
"guestbookpassword",
{ 'RaiseError' => 1 }
);
```

This calls the DBI->connect() method and tells it to return a handle connected to the MySQL database server running on localhost, talking to the database called 'guestbook', signed on as 'guestbookuser' using the password 'guestbookpassword'.

Once we have a handle, we can feed SQL commands to the database:

```
$dbh->do("UPDATE gb SET
visible=0 WHERE comment_id=42");
```

This carries out the UPDATE statement immediately. Or we can prepare a SELECT statement, then fetch each line of the resulting table (in this case, fetching the line as an array of fields):

```
my $sth = $dbh->prepare("SELECT
author, creation_time FROM gb")
|| die $DBI::errstr;
while (@row = $sth
->fetchrow_array()) {
    print "Author: $row[0]\n",
        "Date: $row[1]\n\n";
}
```

Note the 'die \$DBI::errstr' bit; if the prepare() call fails, it returns non-zero – we therefore die(), emitting the value of \$DBI::errstr, which is hopefully an informative error message. At the end of a session, we call disconnect() to shut down the RDBMS connection:

```
$dbh->disconnect();
```

This doesn't even scratch the surface of what you can do with DBI. For the full in-depth tour, you really need to read *Programming the Perl DBI* by Alligator Descartes and Tim Bunce (publisher O'Reilly and Associates, ISBN 1-56592-699-4). Highly recommended – Alligator and Tim invented DBI and wrote more than half the DBD drivers, so they know what they're talking about!

conferencing system that supports threading, and it's nice to be future-proof.)

print\_gb() is the most complex subroutine of the bunch. First, it generates an SQL SELECT statement to retrieve records from the gb table. It calls DATE\_FORMAT() to turn creation\_time into something more human-friendly and it only retrieves records where 'visible' has a value of 1, and where the difference in days between NOW() and the value of creation\_time is less than \$MAIN::max\_age – so you don't display really ancient comments unless you want to set \$MAIN::max\_age to a large number of days.

MySQL does the heavy lifting of retrieving the right records and sorting them in descending date order (most recent postings go at the top). It uses the \$MAIN::max\_items variable (by default, the 50 most recent), to limit the number of items we print, stopping a heavily-used guestbook from spawning megabytes of HTML. Once we call prepare() and execute(), we extract each record

from the result by calling fetchrow\_hashref() on the statement handle returned by prepare().

For a given statement, fetchrow\_hashref() returns the next row, in the form of a hashref. The keys to the hashref are the field names of the table resulting from the statement. For example, we can do this:

```
my $sth = $dbh->prepare("SELECT
author, creation_time FROM gb")
while (my $ref = $sth
->fetchrow_hashref()) {
    print "Author: ", $ref->
{author}, "\n",
        "created: ", $ref
->{creation_time}, "\n";
}
```

All we do in print\_gb() is wrap CGI.pm's ability to generate HTML procedurally around a loop of this type so, instead of printing text, we produce a nice HTML table. **PCP**

**Charlie Stross**  
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## NEXT MONTH

Charlie looks at parsing a data file using Perl.

# Vectors, heaps and queues



*Wilf sorts out your ticketing problems, visits a laboratory and ends up throwing nodes on to a heap – at the bottom, of course...*

**E**very so often you see a feature in a program that adapts its operation to suit the style of the operator. I saw a word processing program that guessed what word you were typing at each keystroke. It continually displayed the rest of the word, enabling me, at a single special keystroke, to accept its guess and save valuable time. To do this, it has to know what words I key most because it would do little good for it to guess that 'labo' was about to become 'laboratory' if it were destined to be 'labour'. Of course, it will correctly revise its guess when I type 'u', but by then it has outlived its usefulness. The way around this is to use priority queuing, and a useful technique for implementing priority queuing is the heap. Heaps usually require vectors, both real and implicit. So, this month in the *Workshop* we will be looking at vectors, heaps and a bit of queuing.

## The meaning of vector

Now 'vector' is one of those interesting words which has been used so loosely that it has almost lost all meaning. Originally it was a precise mathematical term: a 'scalar' was an object with a value assigned to it, while a 'vector' also had a direction assigned to it. Sociologists began to speak of a vector as an object responsible for changing the flow of things (for example, the anopheles mosquito is a vector for the spread of malaria among humans). In operating system architecture, programmers adopted the term 'vector table' for the technique they used to interrupt common system functions. If in your program you

wanted to get control each time a keystroke is made, you would insert the address of your interrupting routine, like a calling card, in a particular entry in the vector table. Whenever a keystroke arrived, the system would read it, then jump to your special routine. This use of the word vector is just about forgivable because a routine address is, after all, an object indicating direction – a 'pointer' to your routine's code.

Visual Basic uses this procedure all the time, activating specific subroutines you have built whenever a prescribed event occurs, such as a mouse click or a change in window size. Think about what structures or commands probably use vector tables in other languages with which you are familiar.

Some computer languages make great use of vectors, by which I mean pointers to data (or code) rather than the data itself: in fact, string processing languages thrive on such ideas as pointers to locations within a string – and then pointers to these pointers so that they can be manipulated by subroutines.

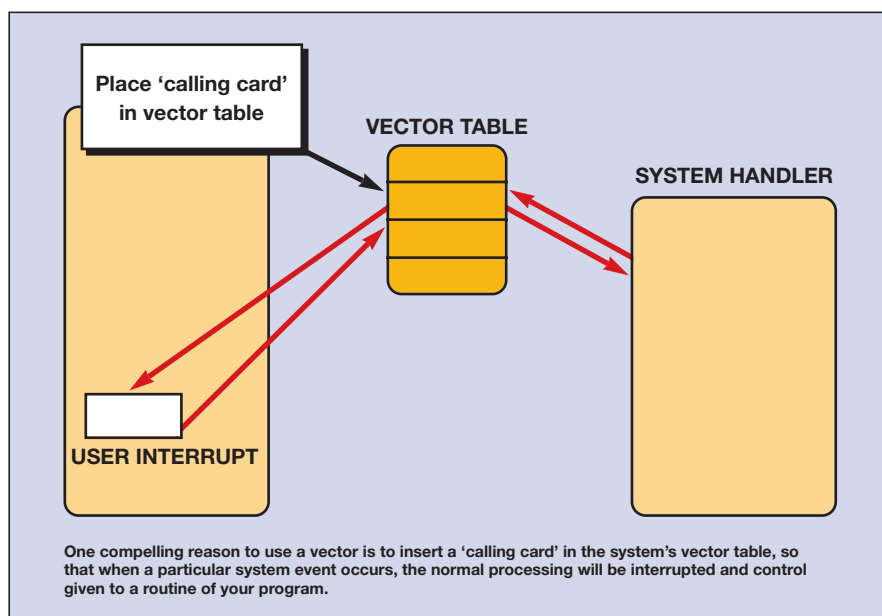
In many modern languages (C and C++ among them) you have two ways of passing parameters between a calling program and a subroutine: directly or by reference. The latter means passing not the actual parameters as

SEE OUR **SUPERDISC**  
PATH: \hanson\wilf.htm.

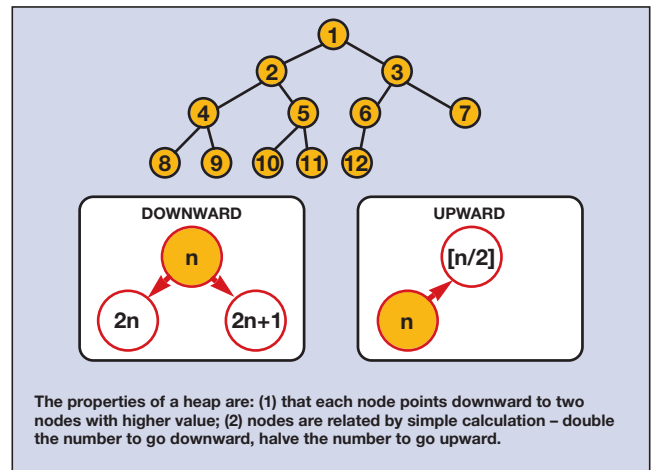
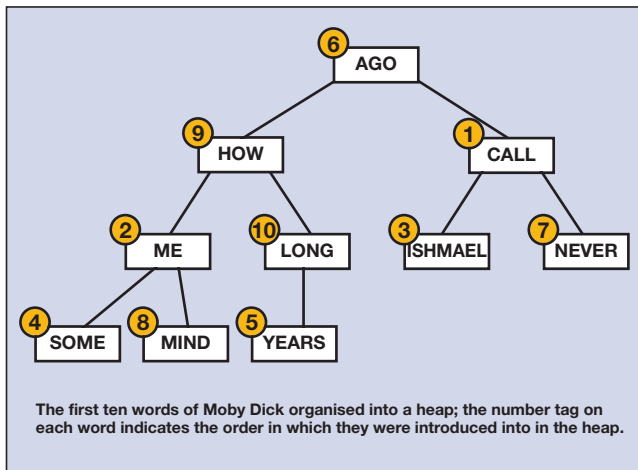
objects themselves, but 'vectors' pointing to them. When the parameters themselves are vectors (as with string processing), you end up with vectors of vectors. Something that hard to visualise is, invariably, difficult for the newcomer to grasp.

Another important use of a vector is to indicate more than immediate information. For example, the data provided about a bullet might include several factors: its weight, composition, shape and location in space. But, if it is 'vectored' we are also given its direction and velocity. With this additional vector data, we know much more, including its location in space at several future moments.

There are practical reasons for using vectors in programming, though the reasons may differ from language to language. As we have noted, the various 'conditions' that invoke subroutines and procedures in Visual Basic are handled by vectors, but the method is seamless to the high-level programmer. C and C++ programmers use vectors routinely – they are forced to use them and so may miss appreciating how practical they are.



**Now 'vector' is one of those interesting words which has been used so loosely that it has almost lost all meaning**



In many programming models, it is necessary to tie one construction with others. Here are a few such places:

1. A table that distributes program flow on the basis of conditions. This can be done with multiple IF statements, or some equivalent.
2. When objects of variable size must be organised in an array, it is often necessary to leave the objects where they are and organise vectors to them instead (since a vector is a fixed length).
3. Nodes of a tree (or some similar graph) require some way to point to each other.

Examples of each of these abound. Here is a vector table; controlling program flow (model 1):

```
IF AGE < 6 THEN GOTO FREE_SEATING
IF AGE < 16 THEN GOTO CHILD_SEATING
IF AGE > 60 THEN GOTO CONCESSIONARY
```

In some languages there is a special structure for program flow under multiple conditions: CASE is such a structure.

As for model 2, when the objects associated with a condition are variable in size – or when there is repetition – it is often more convenient to organise vectors to them into an array, rather than the objects themselves.

The typical example – at least in my programs – of model 3, the use of vectors to connect nodes, is a binary sort or a binary search tree. Typically each object sorted consists of four things: the key to be sorted (and maybe its length); a vector to the whole record being sorted; a vector to the node on the left branch; and a vector to the node on the right branch. If you make one further change and use a vector to the key rather than the key itself, you can end up with a structure made up entirely of vectors, which means that it can fit in a fixed style array, such as the DIM familiar in Visual Basic: no need for any classes, defined structures or other complications. In fact, the value of each left/right vector need not be a memory address: it can be the ordinate number of the appropriate entry in the array. Or it can be a disk address,

with the result that the objects need not be kept in memory all at the same time.

A heap is a variant of a standard binary sort tree. It is made up of nodes, each of which can point to exactly two other nodes. Where the usual binary sort tree may look unkempt, with nodes pointing nowhere or to only one other node, a heap is very neat. Every node is like a stone, resting on two others – except at the bottom, where the last row of ‘stones’ may be incomplete. Every node is arranged so that those it points to do not have a smaller value (otherwise the heap, if it were stones instead of nodes, would fall over).

A heap is organised neatly, but not (yet) fully sorted. It is extremely handy, mainly because it is easy to add a new node to the heap: you add it at the bottom, make a few adjustments and then go on your way with other tasks. The adjustments themselves are simple: you compare the value at the new node with its parent and swap them if they are the wrong way round. If you do swap, you test with the new parent (formerly grandparent) and so on, unless you have risen to the top. ‘Lighter’ values will tend to rise to the top layer of the heap, with the lightest at the very top.

If you write a manager of tasks or memory or time or disk space chunks that need to be prioritised, you can use a binary sort to keep the most pressing ones available. There are two great advantages to using a heap for this purpose:

1. Using a binary sort tree, it is easy to add new items, and also to extract the lowest item: but it is not easy to reject the lowest item and go to another higher alternative for extraction. With a heap, this is easy (examples in the continuation of this article on the *SuperDisc*).
2. If the data arrives in nearly sequential order from the start, adding new items to a binary sort tree can take a relatively long time. With a heap, adding items in any sequence will never need more than a limited number of adjustments (swaps).

The basic idea for adding a node to a heap is to add it at the bottom of the heap, then

swap it upwards until it is in an appropriate place: with a ‘parent’ node that has a lower value, and two ‘children’ nodes that have higher values. You can instantly tell which is an item’s ‘parent’ and which are its ‘children’: they are related not by family but by number. For example, node 6 has node 3 as its parent, and nodes 12 and 13 (if they exist) as its children:

a. The parent of the current node has a number HALF as large (rounded down).

b. The children of the current node have numbers TWICE as large, and TWICE as large plus one.

In the continuation on the *Superdisc* this month we will be looking at the other great use for the heap structure: it forms the first half of a very nice sort algorithm with a difference. Where the ‘quicksort’ (using binary search trees) is blisteringly fast in most cases, already nearly-sorted data can be its downfall. ‘Heapsort’ may not be as speedy but the sort time is about the same, whatever the sequence of data may be. **PCP**

#### NEXT MONTH

Wilf delves deeper into programming theory, and answers your questions.

#### CONTACT

### How to contact Wilf

I’m always pleased to receive letters and e-mail with programming queries, ideas and opinions. As a strict rule I can’t reply directly with personal one-to-one programming advice, but your input could form the basis of a future Workshop. You can e-mail me at

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● Wilf Hey



# WORLD programmers'

The UK's  
definitive  
programming  
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## This month's Programmers' World

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## Transforming XML with XSL



*eXtensible Stylesheet Language can turn your XML data into HTML – or almost anything else. Dermot Hogan shows you how*

Last month we started looking at eXtensible Markup Language or XML. This trendy new technology is sometimes over-hyped on the Web and in the computer press, though not this august publication, naturally! With the rise of e-commerce, XML really does look to being one of the fundamental standards used by just about every Web site and computer system. Even to the point that Microsoft has described XML as being 'the ASCII of the future' (or some such overblown expression).

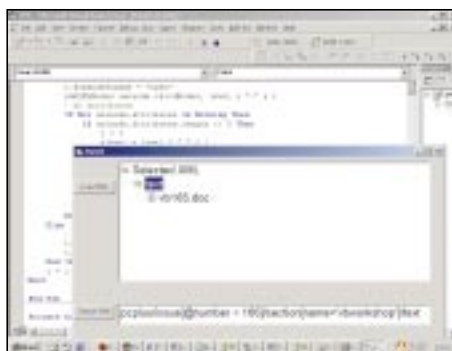
One way of manipulating XML is to use a Visual Basic program as we did last month. Another way is to use another emerging standard – the eXtensible Stylesheet Language or XSL. XSL is nothing to do with the other style sheet language on the Web, the Cascading Style Sheet or CSS. CSS is used to specify the format and layout of HTML elements like this:

```
<P mystyle='skybluepink'>blah</P>
```

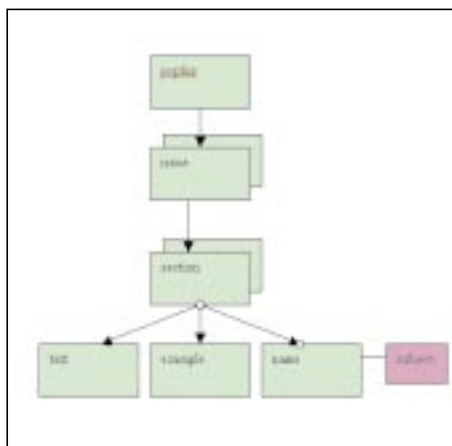
and the paragraph will be duly formatted as specified if the style 'mystyle' exists in a CSS sheet somewhere. XSL, on the other hand, transforms one XML tree into another. An XSL style sheet takes as its input some XML and spits out some more XML.

If that's all there was to it, XSL wouldn't be very interesting – but don't forget that HTML is a type of XML (well, mostly). And if the output of an XSL transformation is HTML, then you've got something more interesting.

But first a couple of words of warning. XSL is still an emerging technology. Both the parsers available and the standards are still evolving.



Using a complex XSL pattern can be quite tricky to debug initially. But once you've got used to the syntax, it's quite easy to enter very complex selection criteria.



The XML tree for our PC Plus catalogue looks like this. The root node, 'pcplus' has several 'issues', each of which has several sections. The data is contained in the 'leaf' nodes – 'text', 'name' and 'example'.



For XSL parsers, this means they've got bugs and, unfortunately, XSL can itself be fiendishly difficult to debug; as for the XSL standard, new things are still being introduced.

Unusually, it seems that Microsoft isn't the main culprit with its 'embrace, extend, exterminate' attitude. There's a genuine debate on how XSL should evolve: it's probably not a good idea to bet the bank on it just yet. Another problem is that XSL will only output a 'correct' XML tree. That is, all tags must be balanced. With HTML this isn't a requirement and you can end up with HTML which won't display in some older browsers because they won't for some reason or other display 'balanced' HTML correctly.

### XSL overview

Now to look at XSL itself. XSL is actually just XML – but it's a good deal more complicated. XSL works by pattern matching in the XML tree. If a pattern is matched, then (roughly speaking) the corresponding piece of XML code attached to the pattern is output. Great, you might think – that sounds easy! So what's the problem?

The main problem comes in that XSL is just pattern matching – no subroutines, procedures, variables or any other of the programming tools that you might take for granted. There is a simple sort of 'if' statement, but that's about it. The other trouble with XSL is the pattern matching itself. Because XML is tree structured, the pattern matching syntax is tailored to scanning down the XML tree: it doesn't look (or



work) much like the standard regular expression system used for scanning text.

First off, all XSL tags start with 'xsl:'. So a comment, that is something ignored by the XSL parser looks like this:

```
<xsl:comment>this is a
comment</xsl:comment>
```

Note the XML tag balancing – the start tag <xsl:comment> is balanced by a closing tag </xsl:comment> as required by the XML syntax rules. Next, the first line in any XSL file has to be this:

```
<xsl:stylesheet
xmlns:xsl="http://www.w3.org/TR/WD
xsl">
```

This tells the parser what level of XSL it's looking at. At the end of the style sheet, you must have a corresponding closing tag:

```
</xsl:stylesheet>
```

Any text that isn't XSL is just output directly (though it does have to be correct XML). So the basic style sheet:

```
<xsl:stylesheet
xmlns:xsl="http://www.w3.org/TR/WDxsl">
<html><body><p>hello
world</p></body></html>
</xsl:stylesheet>
```

will do what you expect if interpreted by an XSL parser.

But before we get round to using full blown XSL style sheets, we'll have a look at using XSL search patterns to pick out bits of XML from the input tree. XSL really consists of two parts. The first one is used to select bits of XML from an XML tree, while the second manipulates these XML fragments, transforming them into other XML/HTML trees. This month we'll concentrate on picking out the bits of XML that we want.

As an example, we've constructed a very simple catalogue of articles in past issues of *PC*

*Plus*. Each issue of the magazine has a number of sections, of which some are the Workshops: *Visual Basic Workshop*, *Wilf's Workshop* and so on. Each workshop deals typically with one topic or subject and, further, let's assume that the catalogue gives a location or file on some hypothetical DVD disc containing all back issues of *PC Plus*. Here's a small example of the XML:

```
<issue number="166">
<section>
<name
subject="XML">vbworkshop</name>
<text>vb166.doc</text>
<example>vb166.exe</example>
</section>
<section>
<name
subject="adventure">delphiworkshop<
name>
<text>delphi166.doc</text>
<example>delphi166.exe</
example>
</section>
</issue>
```

You can see that an 'issue' is composed of a number of 'sections'. Each section has a 'name', a 'text' node and an 'example'. The 'name' node has an XML attribute giving the subject of the article.

We can use XSL pattern selection syntax efficiently to select information from this tree. The key method is the 'selectNodes' or 'selectSingleNode' methods of an XML node. These methods take as their argument an XSL pattern which will select nodes from the XML tree. 'selectNodes' returns a collection of XML nodes that satisfy the XSL search expression, while, alternatively, 'selectSingleNode' returns the first node in such a collection – it's really just a shorthand for:

```
Set rlist = xmldoc.selectNodes(s)
Set selectSingleNode = rlist(0)
```

We've put an example of this in an XML display program, xml.exe on the *SuperDisc*. Load the XML file (hit the 'Load XML' button) and then type an XSL pattern into the search edit box. When you hit 'Search XML' to run it, you should get a nicely formatted XML results tree in the output box.

For small hierarchical data models, XSL is pretty hard to beat. It's fast, free and you don't need a PhD in database design to knock out a data structure in next to no time at all.

Next month, we'll look at XSL style sheet constructs in more detail. **PCP**

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Discuss this article on-line at  
[www.pcplus.co.uk/forum\\_devvb.asp](http://www.pcplus.co.uk/forum_devvb.asp)

## NEXT MONTH

How to manipulate XSL style sheet constructs, using VBScript.

## IN DETAIL

# XSL patterns

*How to search the trees using XSL*

**X**SL patterns are designed to traverse an XML tree. You'll probably have used tree-traversing syntax before – every time you use a DOS command line prompt to change a directory you're traversing a directory tree. XSL patterns are similar in syntax and have the same effect. So while in DOS, you might type something like this:

```
cd \articles\pcplus\visualbasic
```

to move to a given directory, in XSL, you'd use:

```
/pcplus/issue/section/name
```

to move to a point in the tree. Just like a directory, a 'context' is assumed. For a directory tree, it's the current directory, which you can leave out or use a '.'. Similarly, in XSL, if you're at a 'section' node, the pattern:

```
example or ./example
```

will pick out the example descriptions. But note that, unlike a directory tree, all nodes that match the selection criteria will be selected.

So far so good, but XSL pattern matching is a bit more complicated than moving up and down a directory tree. You can match all examples anywhere in the workshop sections by using a '/' syntax:

```
//example
```

will match the nodes from Delphi Workshop, Visual Basic Workshop and so on. You can also use the normal wildcard character '\*' to represent any node at a point:

```
/pcplus/issue/*/example
```

has the same effect (here) as the previous example – however, the two expressions are not normally identical. Remember that XSL selects 'collections'

of nodes – all nodes below a specific point in the tree will be grabbed by the XSL patterns used so far. You can select an individual node (sub-tree actually), by using the subscript operator '[ ]'. The pattern:

```
((/example)[0])
```

will select the first example of all the examples that are in the *PC Plus* catalogue. The brackets, which are used to enforce operator precedence, are necessary, by the way; leaving them out has the effect of returning a collection of first elements – a good example of how tricky the XSL pattern matching syntax can be.

Also, you can select all *Visual Basic Workshop* examples by using the name:

```
//issue/section[name='vbworkshop']
```

There's also a neat selection of operators, similar to those in C++, that will enable you to be more specific about the choice of XML elements. You can select the text of all *Visual Basic Workshop* articles before this issue (166) like this:

```
pcplus/issue[@number <
166]/section[name='vbworkshop']/t
xt
```

This can look a bit obscure (to say the least) at first sight. However, if you read it from left to right, and translate it into English, then it reads: "starting with the 'pcplus' node, select all 'issue' nodes whose 'number' (an attribute) is less than 166. From this collection of nodes, select the 'section' nodes whose 'name' (not an attribute but a real XML node) is 'vbworkshop'. Then from this resulting collection, return the 'text' nodes".

There are a few more pattern wrinkles, but these are the main features of XSL patterns. SQL it certainly isn't, but once you're used to it, it's surprisingly easy to zoom up and down an XML tree getting the bits and pieces you need.

# Huw finds publishing an e-book isn't that easy



*Huw Collingbourne aims to be the next Stephen King – but as E got what it takes?*

**D**epending on your age, E may equal Ecstasy. Or MC<sup>2</sup>. Or just bah gum. Now another Big E has now entered the English language. E for Electronic – as in E-Mail, E-Commerce and, most recently of all, E-Books.

E-Books are springing up all over the place these days. Even top selling author, Stephen King, has published one. When his story, *Riding The Bullet* was released as an e-book on the Amazon site a few months ago, so many people tried to download it that the Amazon server ground to a halt. Since then, everyone and his dog has been eager to jump on the e-book bandwagon. There are now e-books available on everything from horror to horticulture.

But what the heck is an e-book anyhow? The boring answer is that it's just a computer file. The current generation of e-books are PDF (Portable Document Format) files. There's nothing new about PDF files. They've been around for years and, until now, have never been known for their trendiness.

The evolution of dull old PDF files into trendy new e-books owes more to marketing 'spin' than to technical innovation. Many of the new generation of e-books try to look as much like paperbacks as possible. They have cover illustrations, their pages are paperback-size. Nevertheless there's no getting away from the fact that they are still just PDF files. No more no less.

## The Big E

One of the factors that has helped to give e-books a deceptive air of newness is the appearance of dedicated e-book reading software. Up to now, Adobe's Acrobat Reader



has been the only PDF reader most people have even heard of. The trouble with Acrobat is that it looks like a conventional computer application. Its environment is not really much different from something like a Web browser, say.

Now some other companies are producing alternative PDF readers. The one Amazon recommended for the King book is called Glassbook. It has a cleaner, neater interface than Acrobat and it makes it easy to 'turn over the pages' of a book by clicking your mouse. It also has a library screen where it stores thumbnails of all the e-books in your collection.

E-books may come into their own when Microsoft and various partners such as Sony

**You wouldn't expect Stephen King to publish a book as a boring PDF file, would you? But give it a 'cover' illustration and load it into the Glassbook reader and, hey presto!, it's an e-book!**

start producing dedicated E-book reading hardware. These will be hand-help devices, about the size of a paperback. They will let you carry your e-book files around with you and read them on the bus or in the train. Now that surely will be a revolution, won't it? Then again, you could save yourself a few bob and buy a paperback...

Anyhow, never one to let a bandwagon remain unjumped-upon, I decided I'd better get myself up to speed with this e-book nonsense and find out how to publish my own e-masterpieces. It turns out that the simplest and cheapest way of doing this is to create a document in a word processor, install a Postscript printer driver, then use this driver to print your document to a disk file. Next get yourself a copy of the free Ghostscript GSView program from [www.cs.wisc.edu/~ghost/](http://www.cs.wisc.edu/~ghost/). Load your PostScript file into this, then use its pdfwrite device to print the file to disk. Et voilà – you've got yourself a PDF file (erm, I mean, of course, an 'e-book')!

**E-Books are springing up all over the place these days. Even top selling author, Stephen King, has published one**



Huw Collingbourne

## PC Plus

While that's perfectly satisfactory for generating fairly simple PDF documents, I really wanted my own e-books to be formatted using all the layout tricks available in a Desktop Publishing (DTP) package. I also wanted to have all those handy PDF extras such as a table of contents and hyperlinks to let the user zoom instantly from one page to some other related page or to click a Web address in order to launch a browser.

Since Adobe invented the PDF format, I naturally assumed that Adobe's DTP software would be the best tools for designing PDF documents. There's one complication here, though. Adobe has two different DTP packages – the newer of these is InDesign but the more famous is PageMaker. I've always been pathetically impressed by fame, so I opted for PageMaker.

Creating PDF files in PageMaker is pretty straightforward. You just make a menu selection to export the file. PageMaker then runs the separate Adobe Distiller program to convert it to PDF. Tables of Contents or indexes can be converted to hyperlinked PDF indexes and you can also insert hyperlinks manually.

However, while it's reasonably good at generating PDF files, PageMaker does suffer from some irritating limitations. In my innocence, I deleted one block of text, then moved another piece of text. Then I realised I'd deleted the wrong piece of text. No problem, I thought. I pressed the Undo keystroke. This had the effect of 'undoing' my movement of the second piece of text. I pressed Undo again. It 'un-moved' that same piece of text. This was not what I had in mind!

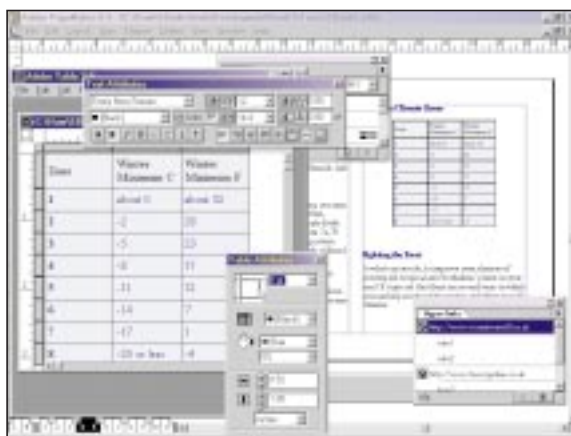
No matter what I did, PageMaker stubbornly refused to restore the deleted text. It was with an air of astonishment bordering on the psychopathic that I realised that PageMaker only has the ability to undo one editing action at a time. Any edits prior to the last one are lost for ever. My deleted text had gone to silicon heaven.

By way of a get-out clause, PageMaker also has an option to revert to the saved version of the document. To be generous, you might say that this has the effect of undoing a whole series of editing actions in a single go. Not being noted for my generosity, I would say that it's actually reloading an out-of-date file from disk.

I usually make it a habit of saving my work frequently. PageMaker's lack of a multiple undo feature means that it is safer for me to save as rarely as possible so that I can 'undo' my mistakes by reloading the document. Ugh!

## Party animal

I next tried Adobe's newer DTP package, InDesign. This does have multiple-level undo and redo (hurrah!). It also has a good range of design features to let you position text precisely, flow words around graphics and so on. But, bizarrely, its PDF support is inferior to PageMaker's. It can export simple pages but it can't export hyperlinks. If you want to add links you need to do so using the Adobe Acrobat



**Adobe PageMaker's table-designer may be old and clunky but I guess it's better than no table-designer at all. Considering their cost, it's amazing how old-fashioned many DTP packages are.**

software which has to be bought separately.

To date I have only used InDesign version 1.0. By the time you read this, InDesign 1.5 will be available. In the interests of honesty and integrity, I wish to declare that Adobe has mailed me a 'party pack' to celebrate the launch of this product. This is not quite on a par with an all-expenses-paid weekend at the Paris Ritz. However, the pack did contain some balloons, water pistols and a bottle of Champagne. I would hate you to think that my journalistic impartiality has been compromised by this gift. I have therefore scrupulously avoided blowing up the balloons or firing the water pistols.

Unfortunately, Adobe the InDesign 1.5 party pack arrived ahead of the InDesign 1.5 software, so while I've drunk the booze, I haven't yet used the program. My comments here, therefore, are based on version 1.0 of the product. One of the things you'll notice when using InDesign is that it goes to some lengths to make users of Quark's QuarkXPress feel at home. InDesign even devotes sections of its manual and help system to QuarkXPress users. It doesn't have anything aimed specifically at PageMaker users, though.

QuarkXPress is, to this day, the DTP package most often used by professional designers. One of the reasons for this is historical. It was one of the first powerful DTP packages for Mac users (that's Mac as in small and friendly computer, not as in dirty old man – though in my experience of Mac users, the two definitions are not mutually exclusive). Many Mac users who have moved to Windows have taken QuarkXPress with them.

QuarkXPress has much broader support for PDF features than InDesign. But it makes extraordinarily heavy weather of using them. Say you want to create hyperlinks. You'd think it should be possible simply to select some text, pop up a dialog and enter a bookmark (or a Web address) to which the hyperlink connects. That's pretty much the way you create hyperlinks in most HTML Web editing programs.

In fact, creating links in QuarkXPress is not a trivial undertaking. First you have to set up style-sheets and define a set of paragraph styles. Then you have to generate a list of the

paragraphs to which these styles have been applied. Then you have to... look, just take my word for it – it's complicated.

QuarkXPress does have other things in its favour. Its text control and layout features are superb. But it also shares some of PageMaker's limitations. Worst of all, it has a single-level of undo. I'm sorry, but in a program costing almost £900, I think this is inexcusable.

Another limitation is its lack of table editing. Tables are so frequently required in publications (*PC Plus* for example!) that I find it quite bizarre that a professional quality DTP package cannot produce them more or less automatically.

In fact, none of the three DTP

packages reviewed above has an integrated table editor. In both Quark Express and Adobe InDesign tables can only be created by aligning text using tabs. There is nothing to compare with the 'Draw Table' command in Microsoft Word. PageMaker 6.5 does have a table editor but this is a separate utility that saves tables as graphics to disk. PageMaker then imports these tables just as it would import other graphics. This is, to say the least, a bit on the clunky side.

I have to say that, given the dramatic increase in the popularity of PDF documents, I am astonished some of the top names in DTP software provide such inadequate tools for designing and exporting PDF publications. I think I may put off publishing my E-masterpiece until I find some more civilised PDF publishing software. Stephen King will no doubt be breathing a sigh of relief...

Contact Huw at: [huwcol@aol.com](mailto:huwcol@aol.com)

Huw's Web site is at: [www.treetops.u-net.com/](http://www.treetops.u-net.com/)

## CONTACTS

### Under Discussion

Contact information for all the software in this article

#### QuarkXPress 4.1 £881

(£750 ex VAT)

The favourite DTP program of most professional designers.

Quark: 01483 445566

[www.quark.co.uk](http://www.quark.co.uk)

#### Adobe InDesign 1.0 £563

(£439 ex VAT)

The successor to PageMaker – version 1.5 will be available by now.

Adobe: 0208 606 4001

[www.adobe.co.uk](http://www.adobe.co.uk)

#### Adobe PageMaker 6.52 £435

(£370 ex VAT)

One of the oldest DTP programs around – and beginning to look its age.

Adobe: 0208 606 4001

[www.adobe.co.uk](http://www.adobe.co.uk)



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Without digging deep into your pocket, you can **set yourself up** with a quality desktop PC for everything from college theses to home accounts. Simon Williams looks at a dozen low-cost contenders

# No-compromise £699 PCs

## Group test: £699 PCs

**‘W**hich PC should I buy?’ is the generic question asked of magazines and magazine journalists alike. Admit you review PCs for a living and party-goers, people on the train, other runners in the London Marathon all stop to ask you what they should buy. Before answering, our standard rejoinder is always ‘What do you want to use it for?’, as there’s little point in spending £2,000 on a machine which is going to be used for writing letters and checking your budget month by month.

If your own answer to the question above is ‘writing my college course work’ or ‘running my local athletics club’ or ‘e-mailing my friends and playing a few games’, this month’s group test will be of great interest. We’ve picked a price of £699, a point in the market above the rock-bottom budget machines, but still at the affordable end.

At this price you can expect to get a system with all the basics in place. You should see good graphics, perhaps with a larger 17-inch monitor, but without a top-flight 3D accelerator. A processor at 500MHz or faster falls in this price range, though it’s likely to be Intel’s budget Celeron, rather than a Pentium III or an Athlon. A good size hard drive of around 10GB is on the cards, but a fast CD-ROM drive rather than a DVD is likely.

You’re unlikely to see multi-speaker systems on the audio side and modems will probably be built-in, possibly software-only devices. Even so, these PCs will be perfectly serviceable as first machines, or possibly as a second PC for the kids. As long as you’re not after DVD movies and the latest 3D accelerator, they would also suit a college or university student. So anything above this base-line specification in the 12 machines in this group is well worth considering.




[www.ssccomputers.com](http://www.ssccomputers.com)


## AVANTI M250

**Avanti was troubled by a faulty 15-inch monitor, in what was otherwise a reasonable system**

■ PRICE £704 ■ EX VAT £599 ■ SUPPLIER Avanti ■ PHONE 0870 755 8866

**A**vanti makes a range of PC systems which stretches from entry-level to mid-price, with the m250 falling around halfway up the field. It's built into a wide midi-tower case, which includes seven drive bays and positions the power supply directly on top of the anonymous system board. There doesn't seem much advantage to this design, as the PC has similar dimensions on the desk to more conventional cases.

A 10-speed DVD drive from Shuttle Inc – not a manufacturer we know – sits above a standard floppy drive and inside is a healthy 16.2GB Maxtor hard drive. While most of the group plump for Celeron processors in their machines, Avanti uses a Pentium III, running at 733MHz.

This should give the machine a very promising performance, but whether because of the SiS graphics chip or some configuration glitch, it returned a SYSmark result around seven per cent slower than the Pentium III 650 in the Quantex system. The 3DMark results were slightly quicker than the Quantex, but there was still a feeling that Avanti wasn't getting as much as it could out of the Intel processor.

Like the machines based on the Intel 810 and 810E chipsets, the graphics circuitry takes what memory it needs for its frame buffer from main memory. There's 64MB here, as there is in all but the Elonex machine, and this is enough to stop excessive disk swapping under Windows 98.

The graphics signal is fed to a 15-inch Smile monitor. The test unit gave a poor picture, with an irregular flicker all the time it was running. This should have been spotted when the system was soak-tested before delivery.

Sound comes from a SoundPro chip on the system board and runs to a Taiwanese SP-70 speaker pair, which is small and pretty ineffective. The keyboard has extra keys for suspend and power control and the mouse is a type 2 Microsoft device – we didn't realise Microsoft was still making these uncomfortable mice.

Overall this is fair machine, but lacks the component quality – in particular its monitor – which would make it stand out from the pack.

### PC Plus

#### VERDICT

##### AVANTI M250

System unit .....	7
Keyboard & mouse .....	7
Video system .....	6
Performance .....	8
Bundles & warranty .....	7
Value for money .....	6

7/10

[www.bigred.co.uk](http://www.bigred.co.uk)


## BIG RED EXPLORER 550

**The Big Red Explorer 550 does well in most areas, but slips up a bit on its monitor, which is 15-inch and has a low refresh rate at high resolution**

■ PRICE £704 ■ EX VAT £599 ■ SUPPLIER Big Red ■ PHONE 08700 711 117

**B**ig Red does well on the general specification of its Explorer 550 system, though there's a dip in the graphics area. The midi-tower case still has room for five drive bays and Big Red has built in a 50-speed CD-ROM and a standard floppy. Inside, there's a Pentium III 550 on the Matsonic system board, which is a touch above the Celerons found in several of the other systems. It comes with 64MB of memory and is supported by a 9.51GB Maxtor hard drive.

Sound is derived from the system board, via an ESDX Audio chip, but there's a separate 56K PCI hardware modem. The speakers are typical Taiwanese fare and are no better or worse than most of their ilk.

The video sub-system in this machine is an odd mixture. Big Red has the sense not to go for an integrated chipset, but fits a separate AGP graphics adapter, based on S3's Savage 4 processor. This card comes with 16MB of graphics memory, but still only walked through the 3DMark games segments, coming up with frame rates of between 20 and 30fps.

Big Red runs the card into a 15-inch Smile monitor which manages a refresh rate of only a flickery 60Hz at 1,024x768. It's better at 800x600, producing a refresh of 85Hz, and this is a more comfortable resolution for this device. The tube face is quite curved, but the picture is fair and controls are very easy to use.

The keyboard and mouse are above average, using a BTC keyboard with soft – perhaps a bit too soft – key feel matched by a Microsoft Intellimouse.

Other test results reflect the processor and memory combination, producing a fair SYSmark result in this company. The MultimediaMark result was about average, too, but overall, a PC Plus index of 6.55 is not bad for a £699 PC.

Big Red includes a good bundle of software with its Explorer system, including two integrated suites, several games and a copy of ViaVoice, the voice recognition package. This is a fair PC, though the monitor could do with improvement – we would always recommend a 17-inch model, if you have the money.

### PC Plus

#### VERDICT

##### BIG RED EXPLORER 550

System unit .....	8
Keyboard & mouse .....	7
Video system .....	6
Performance .....	7
Bundles & warranty .....	9
Value for money .....	7

7/10

**PC Plus**[www.carrera.co.uk](http://www.carrera.co.uk)**CARRERA  
LYNX M533**

**Carrera's Lynx M533 maintains a good build quality, but is let down by the use of an all-in-one system board**

■ PRICE £704 ■ EX VAT £599 ■ SUPPLIER Carrera ■ PHONE 0208 307 2800

**A**s you go down the price scale in a company's catalogue, you expect the specification of the systems to decline steadily in each area, but to remain in overall balance. This is the case with Carrera's Lynx M533 with the most important elements, like DVD drive and monitor, taking the least hit.

The system comes in a Micro ATX case, using a fully integrated system board from Supermicro. This miniature board has a number of shortcomings, most importantly the lack of an AGP video expansion slot. This means that the graphics adapter built into the Intel 810 support chipset is the one you're stuck with. If you have any interest in games, you'll soon notice the limitations of this chip, since it supports only a 16-bit colour palette and uses main system memory to service its own video buffers.

This gives it an unspectacular 3D performance, as witnessed by the low indexes it produced from the 3DMark benchmark at both resolutions. It didn't do well on the MultimediaMark benchmark, either, producing an index of only 1,077, but runs with a reasonable 17-inch Hansol monitor, among the better in this group. It gives a good picture on its near-flat tube face.

There's a 10-speed Panasonic DVD in the top drive bay and a standard floppy drive below that, with a generous 12.6GB IBM hard drive inside. Carrera has fitted a 533MHz Celeron processor which gives a fair performance, though not up to the Pentium III in the Big Red or the 600MHz Celerons elsewhere in the test. There are no ISA expansion slots and only three PCI ones, giving little scope for upgrades.

A software modem sits in a miniature riser card off the system board and sound comes from a Crystal audio chip, which feeds a better than average pair of Altec Lansing ACS22 speakers. The keyboard and mouse are from Key Tronics and Microsoft, respectively and give a good account of themselves.

Carrera supplies a basic software bundle, comprising SmartSuite Millennium and the usual hardware utilities. Overall, this is a well built system, but using a system board built for manufacturer's, rather than user's, convenience.

**PC Plus****VERDICT****CARRERA LYNX M533**

System unit .....	7
Keyboard & mouse .....	9
Video system .....	8
Performance .....	7
Bundles & warranty .....	7
Value for money .....	8

**8/10**[www.elonex.co.uk](http://www.elonex.co.uk)**ELONEX  
WEBRIDER**

**Elonex's WebRider, yet another machine with the same name, has 128MB of memory and a 17-inch monitor – both useful extras**

■ PRICE £704 ■ EX VAT £599 ■ SUPPLIER Elonex ■ PHONE 0800 037 4465

**W**ebRider is a generic name for a range of PCs from Elonex and this one is built around a 600MHz Celeron processor. Unusually, the company has included 128MB of memory, which is double most of the others in the group. More unusually, given the 66MHz bus which all Celerons currently run with, the memory is 133MHz – ideal for processor upgrades. Permanent storage is well provided for, too, with a 50-speed CD-ROM from Acer, a standard floppy and a 12.7GB Fujitsu hard drive.

The system is built into a mini-tower case, which can be quite restrictive for upgrading. Here, though, the Micro ATX system board from FIC includes an AGP slot, in case you want to replace the graphics card, and a single ISA slot, too, for legacy cards. There are three PCI slots, with just one taken up by a 56K US Robotics modem.

The graphics card is an nVidia Vanta device, new to us, and for which we had to upgrade the drivers to get results from the 3DMark and MultimediaMark benchmarks. When they came, the results were reasonable, particularly since the 640x480 resolution test ran at 32-bit colour depth.

At wholesale prices, the difference between a 15-inch and a 17-inch monitor is around £60, but it makes a bigger perceived difference than this. Elonex has included one of its own-brand 17-inch units and although the shadow mask is quite noticeable, the picture is better than from most of the 15-inch monitors in the group. If you intend to run at 1,024x768, 17-inch is a much better size.

Sound is provided by the audio section of the VIA 686 chipset and runs into a cheap and cheerful pair of Creative speakers. Bundled software comprises Works 2000, which is a good base-level package and the usual type of utilities for CD, sound and the modem.

This is a good machine with a respectable turn of speed and a specification noticeably above many of its competition. Elonex has thought about an upgrade path and has included system board and memory which can grow with your needs. It deserves a Value Award.

**PC Plus****VERDICT****ELONEX WEBRIDER**

System unit .....	9
Keyboard & mouse .....	8
Video system .....	8
Performance .....	9
Bundles & warranty .....	8
Value for money .....	10

**9/10**




[www.evesham.com](http://www.evesham.com)


## EVESHAM.COM SCORCHER

**Evesham has produced a worthwhile system, though its 15-inch monitor and Intel 810 graphics count against it**

■ PRICE £704 ■ EX VAT £599 ■ SUPPLIER Evesham.com ■ PHONE 0800 038 0800

**E**vesham's Scorcher uses the same case, though with a different front panel, as Elonex's WebRider. Evesham also chooses a 600MHz Celeron processor to power the Scorcher, but fits 64MB of memory to Elonex's 128MB. This is slotted into a Micro ATX system board from Chaintech, but this one is less well-endowed than the FIC board, with no AGP slot for graphics and no ISA slot, either.

All three PCI slots are vacant, as audio comes from a Crystal Audio chip on the system board and the modem is provided by a small riser card in a purpose-made slot. Sound is directed to a pair of Zy-Fi Compact speakers, which are small and limited, with little bass.

Evesham fits a 40-speed CD-ROM drive from the peculiarly named Behavior Tech company of Taiwan. It performed without problem, so we guess a mark for good behaviour there. A 3.5-inch floppy and a 9.47GB hard drive from Samsung are also included.

Graphics come from the Intel 810 support chipset, not one of our favourite video options. The chipset uses main memory for video and although you shouldn't have trouble with this technique on a 64MB PC, this may not continue to be the case, particularly with games which require more and more of a PC's main memory for their own uses.

Performance is also restricted by the chip's limit of a 16-bit colour palette, like current Voodoo3 chips. Video output is further hampered in this system by the inclusion of a 15-inch Vibrant monitor which supports a refresh rate of only 60Hz at the top SVGA resolution. This makes high resolution displays very flickery.

Overall performance of the machine was good. A *PC Plus* index of 6.59 is well up the field and 3DMark indexes between 2,000 and 3,500 are also acceptable for a machine in this price range.

Evesham provides no application software with the Scorcher and the monitor drops the machine down a notch or two when compared to the systems with 17-inch units. However, its performance and general component balance isn't bad and Evesham has a good name for service and support.

### PC Plus

#### VERDICT

##### EVESHAM.COM SCORCHER

System unit .....	7
Keyboard & mouse .....	8
Video system .....	6
Performance .....	8
Bundles & warranty .....	6
Value for money .....	7

7/10

[www.gateway2000.co.uk](http://www.gateway2000.co.uk)


## GATEWAY ESSENTIAL 433C

**Gateway's Essential 433C is currently under-powered and even with a likely processor refresh, won't match up**

■ PRICE £645 ■ EX VAT £549 ■ SUPPLIER Gateway ■ PHONE 0800 973142

**I**t's hard to see what Gateway is doing here. It has a very basic machine in the Essential 433C, with a slow processor, offered at £645. Perhaps because the box takes up very little desk space – it's based on a Micro ATX system board – it's selling on compactness.

It has only three drive bays in the front panel, two of which are already occupied by a 40-speed LG CD-ROM drive and a standard 3.5-inch floppy drive. Inside, a 9.5GB Quantum hard drive completes the fixed storage, though it's only cabled up as an Ultra DMA 33 device – potentially slower in exacting situations.

The 433MHz Celeron processor also runs that bit slower than the other Celerons in the group, as you'd expect. It's matched by 64MB of memory in an Intel system board. Intel is keen to kill off legacy features like the ISA bus, so this system has only PCI expansion slots. Three are vacant, with an HCF 56K modem in the fourth.

There's no AGP slot on the board, either, meaning you're stuck with the graphics from Intel's 810 chipset. These are low performance, are limited to 64K colours on screen and use main memory for video.

Gateway provides one of its own EV500 monitors, a 15-inch unit which provides a better picture than the Smile or Vibrant units. It supports refresh rates of 85Hz at high resolution, so is flicker-free. Keyboard and mouse are fair, though the key feel is too firm.

Sound comes from a Crystal Audio chip on the system board and runs to a pair of fair Cambridge Audio speakers from Creative. They're a bit bigger than most, which gives them more chance of reproducing bass frequencies.

Just as we were going to press, Gateway confirmed that the 433MHz Celeron has been superseded by a 500MHz model, at the same price. Even with this improvement, the Essential would still be one of the slowest machines in the group, with little else to redress the balance other than price. This machine isn't as essential as Gateway thinks.

### PC Plus

#### VERDICT

##### GATEWAY ESSENTIAL 433C

System unit .....	6
Keyboard & mouse .....	7
Video system .....	7
Performance .....	5
Bundles & warranty .....	8
Value for money .....	5

6/10




[www.higrade.com](http://www.higrade.com)


## HI-GRADE ULTIS PV3-600

**Hi-Grade has made many of the right moves in its Ultis, but offers limited upgrade potential**

■ PRICE £704 ■ EX VAT £599 ■ SUPPLIER Hi-Grade ■ PHONE 020 8532 6100

**H**i-Grade has put together a worthwhile machine in the Ultis PV3-600. In many ways it's a direct competitor to the Elonex WebRider, with a 600MHz Celeron, a 12.7GB Fujitsu hard drive and a 17-inch monitor. It differs in three important aspects, though.

Elonex put 128MB of memory into its PC, while Hi-Grade sticks to the 64MB most of the others use. Instead, Hi-Grade has spent its money (your money?) on a DVD drive. This opens up quite a few possibilities, since it's quite possible to watch DVD movies on a machine in this price bracket, particularly on the larger screen.

Finally, Hi-Grade relies on the graphics abilities (they're not up to being called 'powers') of the 810 chipset, rather than using a separate graphics adapter, which Elonex did. The video performance of the Hi-Grade machine was similar to others with the same configuration, noticeably the Evesham Scorchers.

The Asus system board has no AGP slot, so you can't make any changes to the graphics system, but you can add up to 768MB of main memory. There are no ISA expansion slots and only three PCI ones, but none of these are occupied.

Instead, a dedicated Motorola modem riser card is fitted and the same Crystal audio chipset is used to provide sound off the main board. It runs to a better than average pair of TEAC speakers. The keyboard and mouse combination is fair, with a Logitech Pilot Plus mouse being second favourite to Microsoft's.

The 17-inch monitor Hi-Grade supplies is a re-badged ADi device and would normally give high quality results. On this occasion, though, it was badly out of focus, making text on the Windows desktop hard to read. From previous experience, we expect this to be an isolated problem, but one that should have been spotted before the machine was shipped.

Performance was fair and the Ultis comes bundled with SmartSuite and a Norton utilities. This is a fair machine, particularly if you need the DVD drive. Its graphics system is a bit sluggish, though.

### PC Plus

#### VERDICT

##### HI-GRADE ULTIS PV3-600

System unit .....	9
Keyboard & mouse .....	8
Video system .....	7
Performance .....	8
Bundles & warranty .....	7
Value for money .....	8

8/10

[www.necdirec-europe.com](http://www.necdirec-europe.com)


## NEC DIRECTION SP-533V

**NEC has produced a well-specified system in its Direction SP-533V, though still hampered by the lack of graphics upgradeability**

■ PRICE £704 ■ EX VAT £599 ■ SUPPLIER NEC ■ PHONE 0870 333 6329

**N**EC's Direction series continues to improve in value month by month. This SP-533V looks good and includes some excellent hardware. Its stylish case contains a 100MB Zip drive as well as a 40-speed Samsung CD drive and a standard floppy. It's very useful to have this medium capacity storage included for back-up or file transfer and it's unusual in a PC in this price range.



It's even more unusual to have a Zip drive and a 19.0GB hard drive in a machine costing £700 and the drive is cabled to the faster Ultra DMA 66 standard. The 533MHz Celeron processor is set on another Intel 810e chipset system board, this one from Gigabyte. It comes with 64MB of memory, less that taken for graphics, and is restricted by being to the Micro ATX format. It

has just one ISA expansion slot and no AGP slot, so again you're stuck with the 810 graphics, but the ISA and the three PCI slots are all vacant.

Sound comes from the 810e chipset, as it does on most of the Celeron machines. It drives a pair of Labtec LCS1016 speakers, which are similar in performance to the TEAC and Creative SBS units.

The 810e chipset runs a 17-inch monitor from NEC. This is one of the highlights of the system, as the VR17 is an excellent unit with sharp focus and good contrast. NEC made its name in computer monitors and carries on the tradition here. Keyboard and mouse are well matched and although neither is our preferred choice, they are more than adequate for general use.

Performance was better than from Carrera's Celeron 533, both on the SYSmark and 3DMark benchmarks, though it wasn't in the front line against the faster Celerons and the Pentium IIIs.

NEC has always included good software bundles and here it supplies AND Route 99, Act! and Norton AntiVirus, as well as a full copy of Works Suite 2000. Overall, this is a clean, well-designed system – not the fastest in the group, but certainly one of the best specified. The quality of the components – particularly the 17-inch monitor – win it a PC Plus Value Award.

### PC Plus

#### VERDICT

##### NEC DIRECTION SP-533V

System unit .....	9
Keyboard & mouse .....	8
Video system .....	8
Performance .....	7
Bundles & warranty .....	9
Value for money .....	10

9/10

**PC Plus**[www.qtx.co.uk](http://www.qtx.co.uk)**QUANTEX  
M650S**

**Quantex has squeezed a 650MHz Pentium III into its machine, but also marries the 810E chipset to a 15-inch monitor**

■ PRICE £704 ■ EX VAT £599 ■ SUPPLIER Quantex ■ PHONE 0845 2000 0112

**W**e were surprised on setting up this Quantex system to discover it's based on a 650MHz Pentium III processor. This is the highest clock-rate Intel processor in the group and is only beaten by Time's 700MHz Athlon. There are several other factors which also make the M650E a good system, though there are a couple of negatives, too.

The midi-tower case, taller than many of the machines in the group, still hides a Micro ATX format system board, so several of its back plates have no expansion slot behind them. Even so, there's plenty of room for drives, with a 10-speed DVD and a floppy drive already fitted and a 12.6GB Western Digital hard drive inside.

Sound is provided by the 810E chipset and feeds to a pair of Genie speakers, which are pretty mediocre. They're just okay for general purpose sound effects, but music sounds thin and insubstantial. The keyboard and mouse are workaday and nothing special.

Only one of the three PCI expansion slots was occupied, by a 56K Windows modem. There are no ISA slots, nor an AGP one. Once again, you're forced to stick with Intel 810 graphics.

The monitor is a 15-inch Quantex-branded unit, which gives a better picture than its accompanying 'manual' would suggest. The slip of paper claims a maximum refresh rate of 60Hz at high resolution, but it was set up and worked adequately at a flicker-free 70Hz. Still a small screen, though.

Performance was very good on the SYSmark benchmark, which relies most heavily on the main processor, but the use of the 810 chipset for graphics evened out the results on the 3DMark test, which wasn't as strong as the NEC Direct and several others.

Quantex provides a good software bundle, starting with WordPerfect Office 2000 and the 1999 Grolier Encyclopaedia and adding in all kinds of useful utilities. There's Drivelmage Pro, for instance, which is ideal for backing up or upgrading hard drives. The M650S is a good machine, though the small monitor and comparatively lowly 810E graphics hold it back.

**PC Plus****VERDICT****QUANTEX M650S**

System unit .....	8
Keyboard & mouse .....	7
Video system .....	6
Performance .....	9
Bundles & warranty .....	7
Value for money .....	8

**7/10**[www.simply.co.uk](http://www.simply.co.uk)**SIMPLY COMPUTERS  
SYSTEMAX C600RV**

**Simply Computers has added lots of extra value to its Systemax C600RV machine, but it's still restricted with no upgrade path for graphics**

■ PRICE £704 ■ EX VAT £599 ■ SUPPLIER Simply Computers ■ PHONE 08707 297644

**S**imply has put together an interesting system with some useful extras in its Systemax C600RV. A good size midi-tower case, with plenty of room for extra drives and already including a 10-speed DVD and a LS-120 SuperDisk rather than a floppy enabling you to store 120Mb on one SuperDisk. Inside is a 14.2GB Maxtor hard drive.

The processor is another Celeron 600, the chipset is another Intel 810 and like many of the others it comes with 64MB of memory. This gives it the same core as the Elonex, Evesham and Hi-Grade machines, so to distinguish between them you have to look at performance and the balance of the specification.

Simply has used an AOpen MicroATX system board, which has the same expansion restrictions as the Evesham and Hi-Grade, in having no ISA or AGP slots for upgrading – the Elonex has both.

Sound on the Systemax comes from the 810 chipset and runs a pair of Genie SP-GO6 speakers, which are no better than passable – we wouldn't spend much time listening to music through them.

The 810 graphics are displayed on a 17-inch CTX monitor, which gives a good, clear display and is easy to adjust. It uses a series of LED indicators, rather than an on-screen display, but is, if anything, easier to set up than many OSD-based displays. The keyboard has a good, well balanced feel to the keys and the Logitech Pilot Plus mouse works well with it.

Performance is a bit lower than the Evesham and Hi-Grade. Without the clever trick of running the Celeron's memory at 100MHz, there's little chance of catching the Elonex, but the Systemax is marginally slower than the other two on the SYSmark test, too. It does better on the 3DMark suite, scoring nearly 2,000 on the high-resolution run.

Simply includes a good software bundle, based around Works 2000, but also provides a good quartet of games, including Unreal Tournament. Overall, the provision of the DVD and SuperDisk drives are in the Systemax's favour and the monitor and software are bonuses, too. Performance is adequate but, again, restrictions on graphics upgradeability hold the machine back.

**PC Plus****VERDICT****SIMPLY COMPUTERS  
SYSTEMAX C600RV**

System unit .....	8
Keyboard & mouse .....	7
Video system .....	7
Performance .....	7
Bundles & warranty .....	8
Value for money .....	8

**8/10**


[www.timecomputers.com](http://www.timecomputers.com)


## TIME MACHINE 700-7F XL PROFESSIONAL

**With a radical new design and a faster processor than any other in the group, Time's 700-7f XL Professional is hard to beat**

■ PRICE £704 ■ EX VAT £599 ■ SUPPLIER Time ■ PHONE 01282 777555

**T**ime has a cunning knack of topping all the other competitors in a group test and yet – presumably – still making a profit. This midi tower system, if tower is the proper term, does the unthinkable with the traditional design of a PC – it puts the drives at the bottom of the case – Shock! Horror!



As well as making them easier to reach when the PC is on a desktop, this design change also lowers the centre of gravity of the case, making it very stable. There's limited room for drives in the case, though, as it slopes off in an elegant curve with a handle on top, so you can hump it around. A 40-speed LG CD and a floppy drive are included and there's an 8.55GB hard drive – lower capacity than most. Just to prove it's really radical, Time hasn't used a Celeron processor, either. Instead, there's a 700MHz Athlon inside, with 64MB of main memory. At a stroke, the company has provided the best performance in the group by a considerable margin. It hasn't stopped there, though.

Although the system board is another Micro ATX format board, it uses an nVidia Riva TNT2 graphics processor on-board, with 32MB of dedicated memory. While there's no AGP slot for upgrade, performance from this chip is noticeably better than from Intel's 810, so there's less reason to want to change it.

The monitor, labelled Time 17s but actually re-badged from Samtron, was fine until it took a dive and lost focus in a bad way. This was unfortunate, but components do fail and a replacement would be covered under warranty. Time says the return rate on these Samsung devices is very low and our experience is the same, so we're treating this problem as an isolated incident.

The keyboard, from Key Tronics, and mouse – a Microsoft Intellimouse – are a very good combination, though the Key Tronics isn't the light touch model that gets our top rating.

As always, Time tips in a bucket of software. This particular pail centres on Works 2000 and adds in a stack of other useful reference titles and utilities. The 700-7f XL Professional is faster and better specified where it counts (processor, graphics and graphics memory) than any other in the group. It wins Gold.

### PC Plus

#### VERDICT

##### TIME MACHINE 700-7F XL PROFESSIONAL

System unit .....	9
Keyboard & mouse .....	9
Video system .....	9
Performance .....	10
Bundles & warranty .....	8
Value for money .....	10

**10/10**
[www.viglen.co.uk](http://www.viglen.co.uk)


## VIGLEN HOMEPRO C600PLR

**Viglen has produced another strong, purposeful system in the HomePro C600PLR – particularly in its audio set-up**

■ PRICE £704 ■ EX VAT £599 ■ SUPPLIER Viglen ■ PHONE 0208 753 7000

**V**iglen always knows how to put together a well-balanced and reliable system and the HomePro range has already attracted much critical attention. The C600PLR uses a midi tower case and fits it with a 10-speed Pioneer DVD drive and a standard floppy, completing the storage with a 9.5GB hard drive inside.

Another company to use a 600MHz Celeron as the power pack in its system, Viglen backs it up with 64MB of memory and like most of the others, uses an Intel 810 chipset to support it.

Although the case is tall, the system board is another Micro ATX design, with just three PCI slots. The lack of an AGP slot is as annoying here as with all the others, but all three PCI slots are free – the Motorola modem sits in a dedicated system board slot. Sound comes from the 810, and feeds a trio of Altec Lansing speakers, ACS33s. These are by far the best set in the group and give a well-balanced sound, suitable for everyday music playback as well as for game sound-effects.

The video signal feeds a 17-inch Viglen CM700, a re-badged ADi display which gives a very good picture and is easy to adjust, though the push buttons are a bit small. It provides good focus and contrast, with little noticeable shadow mask – a well designed, clear monitor.

The keyboard and mouse are above average, with a Logitech Pilot Plus mouse and Microsoft's Internet keyboard. The mouse is good enough, but the key feel of the Microsoft device is harsh and the keystroke is too short, in our opinion.

Performance on the SYSmark test was nearly up to the Elonex WebRider, and the low-resolution 3DMark result was considerably higher, though evening up when we increased it to 1,024x768.

Viglen bundles a copy of Works Suite 2000, which provides you with most of what you need to set up and use the system, except a game or two. This is a good system with nothing out of place, but without the extra performance or feature set to push it out in front, when compared to the other machines.

### PC Plus

#### VERDICT

##### VIGLEN HOMEPRO C600PLR

System unit .....	8
Keyboard & mouse .....	7
Video system .....	8
Performance .....	8
Bundles & warranty .....	8
Value for money .....	8

**8/10**

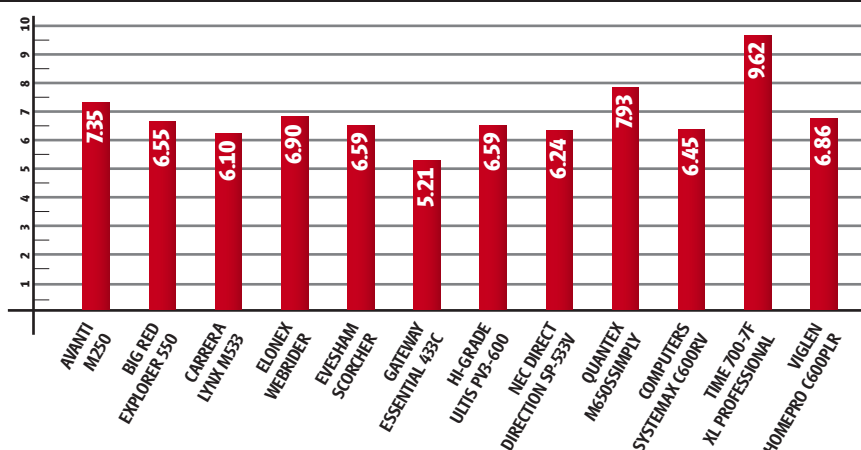


## PC PLUS PRODUCT FACTS

	m250	Explorer 550	Lynx M533	WebRider	Scorcher	Essential 433C
<b>Supplier</b>	Avanti	Big Red	Carrera	Elonex	Evesham	Gateway
<b>Supplier type</b>	Direct	Direct	Direct	Direct	Direct	Direct
<b>Telephone number</b>	0870 755 8866	08700 711117	0208 307 2805	08000 374465	0800 038 0800	0800 97 3124
<b>Price</b>	£704 (£599 ex VAT)	£704 (£599 ex VAT)	£704 (£599 ex VAT)	£704 (£599 ex VAT)	£704 (£599 ex VAT)	£645 (£549 ex VAT)
<b>Warranty</b>	1 year on-site	1 year on-site + 4 years b-to-b, lab only	2 years on-site	1 year on-site	1 year on-site + 2 years back-to-base	1 year on-site + 2 years back-to-base
<b>Delivery charge</b>	£29	£29	£34	£19	£34	£42
<b>Credit card surcharge</b>	None	None	None	None	None	None
<b>Proc. type – Speed (MHz)</b>	Pentium III EB – 733	Pentium III – 550	Celeron – 533	Celeron – 600	Celeron – 600	Celeron – 433
<b>Chipset – Bus speed (MHz)</b>	SiS 630 – 100	VIA 693/596A – 100	Intel 810 – 66	VIA 694/686A – 66	Intel 810 – 66	Intel 810 – 66
<b>Supplied memory (MB)</b>	64	64	64	128	64	64
<b>Maximum memory (MB)</b>	1GB	768	512	1.5GB	512	512
<b>Secondary cache (K)</b>	256	256	128	128	128	128
<b>Hard drive capacity (GB)</b>	16.2	9.51	12.6	12.7	9.47	9.54
<b>Hard drive make</b>	Maxtor	Maxtor	IBM	Fujitsu	Samsung	Quantum
<b>CD-ROM make – speed</b>	Shuttle – DVD 10x	Acer – 50x	Panasonic – 10x DVD	Acer – 50x	Behavior – 40x	LG – 40x
<b>Other drives and devices</b>	Floppy, HSP56 modem	Floppy, HSF 56K modem	Floppy, software 56K modem	Floppy, US Robotics 56K modem	Floppy, AMR 56K voice modem	Floppy, HCF 56K modem
<b>ISA Expansion slots – free</b>	0	2 – 2	0	1 – 1	0	0
<b>PCI Exp slots – free, AGP</b>	2 – 2, 1	4 – 3, 0	3 – 3, 0	3 – 2, 1	3 – 3, 0	4 – 3, 0
<b>Monitor</b>	Smile CA6525DL	Smile CA6525DL	Hansol 710A	Elonex MN017HS	Vibrant VM51RDA	Gateway EV500
<b>quoted diagonal (in)</b>	15	15	17	17	15	15
<b>measured diagonal (in)</b>	13.75	13.75	15.75	16.00	13.75	13.75
<b>dot pitch (mm)</b>	0.28	0.28	0.27	n/a	0.28	0.28
<b>Video adapter</b>	SiS 630	S3 Savage 4	Intel 810	nVidia Vanta	Intel 810	Intel 810
<b>video memory (MB)</b>	Main memory	16	Main memory	8	Main memory	Main memory
<b>Serial ports</b>	1 x 9, 2 x USB	2 x 9, 2 x USB	2 x 9, 2 x USB	2 x 9, 2 x USB	1 x 9, 2 x USB	1 x 9, 2 x USB
<b>Parallel</b>	1	1	1	1	1	1
<b>Make of mouse</b>	MS Type 2	MS Intellimouse	Microsoft	MS Intellimouse	Logitech Pilot Plus	MS Intellimouse
<b>Operating system</b>	Windows 98 SE	Windows 98 SE	Windows 98 SE	Windows 98 SE	Windows 98 SE	Windows 98 SE
<b>Bundled software</b>	WordPerfect Suite 8, CD/modem/sound utils	SmartSuite Mill, WP Suite 2000, Via Voice, 3 games CD/modem/sound utils	SmartSuite Mill, DVD/modem/sound utils	MS Works 2000, CD/modem/sound utils	CD/modem/sound utils	MS Works 2000, Go-Back, CD/modem/sound utils
<b>Sound card</b>	CMi8738	ESDX CMI 8738	Intel/Crystal Audio	VIA686	Intel/Crystal Audio	Intel/Crystal Audio
<b>Speakers</b>	SP70	Navigator AN-2000	Altec Lans ACS22	Creative	Zy-Fi Compact	Creative SBS52
<b>BIOS make</b>	AMI	Award	AMI	Award	Award	AMI
<b>Power – Suspend (W)</b>	125 – 70	132 – 24	137 – 24	154 – 67	182 – 204	145 – 160
<b>Faults as supplied</b>	Flickery monitor	None	None	Wouldn't run 3DMark Corrupted MMark display	None	None
<b>Verdict</b>	7/10	7/10	8/10	9/10 Value	7/10	6/10



## PC PLUS INDEX RESULTS







	Ultis PV3-600	Direction SP-533V	M650S	Systemax C600RV	700-7f XL Professional	HomePro C600PLr
Supplier	Hi-Grade	NEC Direct	Quantex	Simply Computers	Time	Viglen
Supplier type	Direct	Direct	Direct	Direct	Direct	Direct
Telephone number	020 8532 6100	0870 333 6329	0845 200 0112	08707 297644	01282 777555	0208 753 7000
Price	£704 (£599 ex VAT)	£704 (£599 ex VAT)	£704 (£599 ex VAT)	£704 (£599 ex VAT)	£704 (£599 ex VAT)	£704 (£599 ex VAT)
Warranty 1 year on-site	1 year on-site	1 year on-site	1 year back to base	3 years back to base, 2 and 3, labour only		1 year back to base
Delivery charge	£15	£35	£41	£29	£40	Included in price
Credit card surcharge	None	None	None	None	None	None
Proc. type – Speed (MHz)	Celeron – 600	Celeron – 533	Pentium III – 650	Celeron E – 600	Athlon – 700	Celeron E – 600
Chipset – Bus speed (MHz)	Intel 810 – 66	Intel 810E – 66	Intel 810E – 66	Intel 810E – 66	AMD 751/756 – 100	Intel 810E – 66
Supplied memory (MB)	64	64	64	64	64	64
Maximum memory (MB)	768	512	512	512	512	512
Secondary cache (K)	128	128	256	128	512	128
Hard drive capacity (GB)	12.7	19.0GB	12.6GB	14.2GB	8.6GB	9.5
Hard drive make	Fujitsu	Quantum	Western Digital	Maxtor	Fujitsu	Fujitsu
CD-ROM make – speed	Pioneer – DVD 10x	Samsung – 40x	Toshiba – DVD 10x	Pioneer – DVD 10x	LG – 40x	Pioneer – DVD 10x
Other drives and devices	Floppy, Motorola 56K modem	Zip 100, floppy, Motorola 56K modem	Floppy, 56K Windows modem	LS-120 Superdisk, Conexant 56K modem	Floppy, HSP56 Micro Modem, joystick, gamepad	Floppy Diamond V90 modem
ISA Expansion slots – free	0	1 – 1	0	0	0	0
PCI Exp slots – free, AGP	3 – 3, 0	3 – 3, 0	3 – 2, 0	3 – 2, 0	3 – 2, 0	3 – 2, 0
Monitor	Hi-Grade CM700	NEC VR17	Quantex XP150DP	CTX PL7	Time 17s (Samtron)	Viglen CM700 1
quoted diagonal (in)	17	17	15	17	17	17
measured diagonal (in)	15.75	15.75	13.75	16.00	15.75	16.00
dot pitch (mm)	0.26	0.28	0.28	0.27	0.28	0.28
Video adapter	Intel 810/Asus driver	Intel 810E	Intel 810E	Intel 810E	nVidia Riva TNT2	Intel 810E
video memory (MB)	Main memory	Main memory	Main memory	Main memory	32	Main mem + 4MB
Serial ports	2 x 9, 2 x USB	1 x 9, 1 x USB	1 x 9, 2 x USB	1 x 9, 2 x USB	1 x 9, 2 x USB	1 x 9, 2 x USB
Parallel	1	1	1	1	1	1
Make of mouse	Logitech Pilot Plus	Logitech Pilot Plus	Microsoft	Logitech Pilot Plus	MS Intellimouse	MS Intellimouse
Operating system	Windows 98 SE	Windows 98 SE	Windows 98 SE	Windows 98 SE	Windows 98 SE	Windows 98 SE
Bundled software	SmartSuite Mill, Norton AV, Norton Ghost, CD/modem/sound utils	WorksSuite 2000, Act!, AND Route 99, Norton AV, CD/modem/sound utils	WordPerfect Office 2000, Grolier 1999, Drivelmage Pro, McAfee, AVEnfish Tracker, CyberSnoop, DVD//modem sound utils	WorksSuite 2000, ACID music, Unreal Tournament, Driver, Roller Coaster Tycoon, UEFA Champions League, CD/modem/sound utils	WorksSuite 2000, SmartSuite Mill, Power Pub, Money Matters, ViaVoice, Homewise, Laplink 2000, SATs Maths, English, Science, CD/modem/sound	WorksSuite 2000, DVD/modem/sound utils
Sound card	Intel/Crystal Audio	Intel/Crystal Audio	Intel/Crystal Audio	Intel/SoundMax	Creative SB128 PCI	Intel/SoundMax
Speakers	TEAC Pmax 80/2	Labtec LCS1016	Genie SP-G06	Creative SB552	ScreenBeat Pro 50	Alt Lansing ACS33
BIOS make	Award	AMI	Award	Award	AMI	Award
Power – Suspend (W)	154 – 50	132 – 50	132 – 50	132 – 55	175 – 60	190 – 211
Faults as supplied	None	None	Screen corruption on MMark	Windows set for US	Monitor defocussed badly	None
Verdict	8/10	9/10 Value	7/10	8/10	10/10 Gold	8/10

## UPGRADEABILITY

## Integration overkill

*What to look out for in you want to upgrade*

**Y**ou can get good value spending £700 on a PC, but there are things you may want to do to it later on to add to its value or prolong its life. Upgradeability is something that's rarely included in the feature list in PC adverts, but can be an important factor if money's tight.

One of the big no-nos in upgradeability terms is integrated system boards. It may make sense for a supplier to buy one board incorporating graphics,

sound and modem – it'll certainly be cheaper for them. However, if you want to boost any of these items by replacing them with higher specification parts, you'll need to be able to plug them in somewhere.

Particularly bad are system boards which incorporate graphics processors, but include no AGP slot you can plug in a better graphics card later on. Without this slot, there's nothing you can

do about the graphics in your PC, apart from replacing the whole system board.

Sound chips are usually easier to by-pass. You can often switch off the sound chip on the system board from within the BIOS software, and the PC will then use whatever replacement sound card you've plugged in. Make sure you have vacant PCI expansion slots on the board, though, or you won't have anywhere to plug a new card in.



# PC Plus Verdict

## ANALYSIS

### Looks aren't everything

**T**he design of a PC has become very formalised over the years. Tower machines are in the majority and in these cuboid boxes everything has a place. The drive bays are at top front, with the power supply behind them at top rear. Further down is the system board with processor, memory and expansion cards plugged into it. The design works well, so few have thought to change it.

In fact, there are plenty of ways of putting all these bits into a box using different layouts, some of which have positive advantages over the accepted design. Time has shown one in the configuration of its Time Machine 700-7f XL Professional. This PC, with its attractively rounded lines and built-in carrying handle, does things a different way.

It places the drives and power supply at the bottom of the case, lowering the centre of gravity and making the machine very stable. The drives are easier to reach, too, as they're nearer the desktop (assuming you have the machine on, not under, your desk).

There have been other attempts to break the conservatism of PC design, the most notable being Apple's iMac, but most redesigns of PCs have suffered from high prices or servicing problems. When you squeeze all the essentials into a small box, as in a notebook, servicing suddenly becomes a specialism, rather than something the guy down the road can do.

As with most things, current PC designs are a compromise. It's a choice between looks and accessibility, with accessibility definitely having the upper hand.



## OTHER NOTABLES

**T**here are a lot of good machines in this group – witness the number of scores of eight and above. Any of these machines would make good general purpose PCs for use at home, college or in a small business. Even with the tight restriction on price, we got entries from Carrera, Hi-Grade, Simply and Viglen with 17-inch monitors, DVD drives, and fast Celeron processors.

Although in each case you're tied to Intel's 810 chipset for graphics, it's hard to get around this, unless you specify in your order that you want an AGP socket in your machine, so you can upgrade graphics at a later date.

The Celeron solution is perfectly adequate for all general-purpose tasks and with 64MB of main memory you'll have no key restrictions on the applications you can run under Windows 98. If you decide to move to Windows 2000, you might want to add another 64MB, but other aspects of these machines shouldn't need upgrading.

It's hard to separate these four machines, but we'd give it to the Simply Systemax, which has a larger hard drive and includes a Superdisk drive for medium level storage. These two extras give it an edge, but check out the three prize winners, first.

Ask 12 PC suppliers what's good value at £699 and you'll get 12 different answers. They'll vary from a real base level PC to something many would expect to pay more for. You need your wits about you to get the best deal

## BEST BUY – GOLD

### TIME MACHINE 700-7f XL PROFESSIONAL

■ PRICE £704 ■ EX VAT £599 ■ SUPPLIER Time ■ PHONE 02182 777555 ■ WWW [www.timecomputers.com](http://www.timecomputers.com)

**T**his is another winning specification and performance from Time. The machine starts with Time's stylish redesigned system unit, which includes an Athlon 733 processor, way ahead of anything else in this group on performance. Although the machine lacks an AGP slot for graphics upgrade, it includes a fast nVidia Riva TNT2 graphics chip with 32MB of memory on-board, so will give adequate graphics performance for most uses, anyway.

We did have trouble with the Samtron monitor supplied with the machine, but are prepared to accept that this is an isolated incident. We've tested this particular model before and have never seen this defocus problem on another unit.

As always with Time, you have all the software you're likely to need included in the price. You may not use it all, but there are basic programs in most of the areas you might want, including several educational titles. This machine is a bargain and a fast bargain at that.



## BEST BUY – VALUE

### ELONEX WEBRIDER

■ PRICE £704 ■ EX VAT £599 ■ SUPPLIER Elonex  
■ PHONE 08000 374465 ■ WWW [www.elonex.com](http://www.elonex.com)

### NEC DIRECTION SP-533V

■ PRICE £704 ■ EX VAT £599 ■ SUPPLIER NEC Direct  
■ PHONE 0870 333 6329 ■ WWW [www.necdirec-europe.com](http://www.necdirec-europe.com)

**U**sually, there are two machines in this group worthy of Value Awards. Elonex's WebRider, yet another machine under this name, comes with several interesting features. The most unusual of these, in this company, is 128MB of memory. While this may not be essential, it's a useful bonus and goes well with Elonex's obvious forethought in building the WebRider to last. It uses an nVidia graphics card which gives better performance than most here and sits in an AGP slot, which enables upgrades. Add to this a VIA chipset which offers a separate clock for the Celeron's memory and provides extra performance and you have a Value winner.

The same goes for the NEC Direction SP-533V, but for different reasons. The Direction offers the highest capacity hard drive in the group, at over 19GB, and adds in a Zip 100 drive for back-up and file transfer, as well as the standard floppy drive. It has the best monitor reviewed here and a well-balanced software bundle, with something for most people. Its Labtec speakers are also better than many pairs include with systems in this price range. It's well designed and put together and both it and the Elonex machine are ideal second choices, if for any reason the Time Machine doesn't appeal.



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# Protect and survive

Everybody should have virus protection – the Internet has made it more important than ever. **Wilf Hey** looks at the leading packages and gives them a thorough testing





## Group test: anti-virus software

**T**hey say ignorance is no excuse, and this is certainly true when it comes to coping with computer viruses. Even though a great deal of misinformation persists and scare stories abound, there is a real threat to the data and programs on your system from viruses – yet there are excellent software packages that are available now to make life simpler and easier. And they won't cost you an arm and a leg.

Viruses are tiny programs that attach themselves like a barnacle to another program and make themselves appear part of that program. When their code is executed, they create new copies of themselves to attach to yet more programs. About half of the known viruses do no more than this; the other half have a sting in their tale and perform some sort of 'trick'. This trick can be anything from a pair of eyes looking toward your mouse cursor, to a hidden routine that reformats your disk.

It should be noted that even 'innocuous' viruses are dangerous: even if it merely copies itself, any virus takes up space, slows down operations on the computer and still poses a potential threat whenever the operating system is modified – who

knows what hidden feature was exploited, and whether it is still there. Even more worrying is the fact that if you have 'caught' an unknown virus, you have no way of anticipating what might happen to your computer resources, and when. Ignoring a viral infection is like jumping from a tall building and musing a few feet above the pavement that everything is all right so far.

Unlike their biological counterpart, computer viruses do not spring into existence spontaneously. There is, unfortunately, a sort of person who thinks himself brilliant to be able to craft a virus – especially if it uses some 'secret' knowledge about the operating system. What results is a never-ending battle between the author of new viruses and the virus experts who strive to keep data safe, not only on global enterprise systems but on your own desktop or laptop PC.

The best strategies against viral attack are vigilance and intelligent, safe behaviour. It is important to keep up to date with the virus threat because new inroads are being made all the time. Much of the fight has moved from infected floppies to dangerous downloads: from contaminated EXEs to corrupted Word macros.



### TECHNICAL BRIEFING

## How a scanner works

*The typical anti-virus package consists of several parts. These may include the following:*

**1** An 'on-demand' scanner: this is a search program, which reads as data various files on a particular disk or part of a disk, and reports whether any of them contains code that suggests it has been infected by a known virus. The most sophisticated of this type of scanner will be able to do this with both EXE-type viruses and macro viruses, and also recognise slight variants of these viruses. It should be able to look inside ZIP (archived) files, and recognise polymorphic specimens.

**2** A scheduling feature, so that at specified times or after specified intervals a predefined 'on-demand' scan will be made. One common strategy is to create a scheduled scan that will inspect all the files and e-mails downloaded in their common areas.

**3** A monitor scan, which inspects each program just after it has been loaded, but before it has been executed. If virus code is found within its allocated memory, the program is not run, and a special

cancellation notice is raised. This is a line of defence that takes an extra few seconds each time a program is used, but prevents mishaps when running new programs. An alternative strategy is to make a 'snapshot' of the program: crucial information at the start and end, plus a checksum. The snapshot will only be made when the program is declared clean by the 'on-demand' scanner.

**4** Various routines that detect (and often block) certain behaviour: for example, when a disk is first accessed, its boot record will be inspected to confirm that it is uninfected. Memory can be scanned for remnants of a known virus still sitting in memory. Some anti-virus products look out for calls to special services that are unusual in normal operations, since they may be used to mask forbidden or dangerous activities.

**5** Certain information about the symptoms and effects of various viruses, and information about how to remove them, is often available in the form

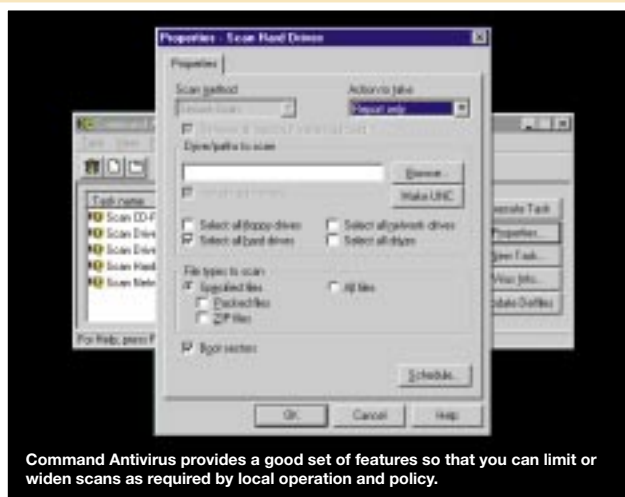
of a database or 'encyclopedia'. This is especially useful if you are passing on software or data to another location, and find an infection: it is not always good enough to rid yourself of a virus: it may be important to know how you were attacked, and by which virus.

Basically, a scanner works by searching through the physical bytes of a file looking for a string known to occur within a virus infection. Along with the string should be other pieces of information to help in its determination (for example, size of infection), all locked away in a database. The more powerful scanners must also handle virtual expansion of archived records (ZIP), and be on the lookout for self-encryption and code variation (such as dummy redundant instructions). One technique which appears in most scanners today is 'heuristic scanning', in which the scanner makes incidental notes about what it finds in a program – no hard evidence of a virus, but circumstantial evidence. If there is sufficient circumstantial evidence (based on a point score) the program is marked as 'probably infected with an unknown virus'.





## COMMAND ANTIVIRUS FOR WINDOWS 4.58



Command Antivirus provides a good set of features so that you can limit or widen scans as required by local operation and policy.

■ PRICE £59 download from Web ■ EX VAT £50 ■ SUPPLIER Command Software ■ PHONE 020 7931 9301

[www.command.co.uk](http://www.command.co.uk)

### A good package with 'early warning' and flexibility

**C**ommand Antivirus is notable as one of the first to prove in tests that it can reliably disinfect virus-ridden files (where possible) in connection with all 'viruses in the wild'. The technology behind this package primarily looks for virus-like behaviour, but then confirms the identity of a 'suspect' virus by checking for its distinctive 'signature'. What results is an extremely fast product that is still proficient at finding viruses and provides the bonus of being very good at pointing out the appearance of a suspected new virus.

The support staff at Command were delighted that their technology paid off with the outbreak of the 'Melissa' virus. This spread widely through the Web and was one of the first encounters to illustrate the need for detection of virus-like behaviour as well as identification – because now a successful virus can spread across the world before it has been analysed and countered by anti-virus researchers.

Command is easy to run when it has been intelligently set up, but we were disappointed with its default running, particularly the multiplicity of the policy decisions you have to make in order to set up options. In our opinion it needs a few good wizards explaining the consequences of setting the various options. Instead of that we found rather inadequate documentation.

In short, Command is a good and fast tool, well capable of being excellent anti-virus protection for your desktop (and it can boast the same of many configurations of networks as well), but rather lets itself down by becoming difficult for newcomers to the battle against viruses. If you are already familiar with what is expected of a seamless anti-virus suite, the Command may be just what you want.

Again, the scheduling of scans is remarkably adaptable and the nature of scans can be varied tremendously – too well, because it can become confusing. Not only that, but unfamiliarity with anti-virus measures can mean that an inexperienced user may well think he is being provided ultimate protection when he has, in fact, unwittingly compromised it with an inappropriate use of options.

### PC Plus

#### VERDICT

#### COMMAND ANTIVIRUS FOR WINDOWS 4.58

*For Fast and efficient; flexible to suit needs*

*Against Badly let down in the area of documentation*

Range of features.....10

Ease of operation.....6

Documentation.....6

Effectiveness...Detected all 'viruses

.....in the wild'

Value for money.....7

6/10

## ALADDIN KNOWLEDGE SYSTEMS E-SAFE



E-Safe provides a particularly clear log of scans that it has executed and the precautions taken whenever it finds an infected file.

■ PRICE Free for download ■ SUPPLIER Aladdin ■ PHONE 01753 622 266

<http://ealaddin.com>

### Operation is eccentric: it's easy to bypass its power

**E**-Safe has, on occasions in the past, been successful while endeavouring to detect the 'viruses in the wild' collection, but it failed on this occasion to detect two of the known viruses presented to it. This package provides a means of setting up how the scanner should react to finding a virus. We did not feel that the default (though safe) was sensible – especially in light of fast infectors that may strike many files in a single directory virtually instantaneously. The default is to stop on each infection and demand a button push to continue – either to delete the file, leave it as is or to cancel the scan. This could radically disrupt time allocated to scanning maintenance and would probably demoralise a neophyte operator who should not be asked to render policy decisions. Another perplexing factor is that viruses that the package decides are 'removable' are assigned a different default from those it decides are 'not removable'. And the latter category, sadly, includes all viruses that infect executables, it decided.

The lack of complete accuracy may be a temporary glitch and may be rectified shortly but the inexplicable eccentricity of its operation makes this package one to be viewed carefully. We expect that anti-virus software for the desktop should be relatively simple and completely unobtrusive. Furthermore, in a larger environment (such as a network) it seems a very unwise thing to allow the operator of a workstation to make a policy decision that should have been made at a central location.

We could not work out an effective way to isolate a single file when it has been found infected – a safeguard that is a normal requirement of many security policies. The documentation was not much help in this regard.

There are some interesting features to this package and its scanning speed is good. Its hard reporting is impressive and it provides a useful summary of files scanned on the screen. It is quite possible that, given time, a user could come to grips with this package. It is not, at first glance, seamless and its default options for treating viruses are not sensible for the average user.

However, the price is right: for home desktop use, you can download a copy from the Aladdin Web site for free.

### PC Plus

#### VERDICT

#### ALADDIN KNOWLEDGE SYSTEMS E-SAFE

*For Free*

*Against Operation unusual and not easy*

Range of features.....8

Ease of operation.....5

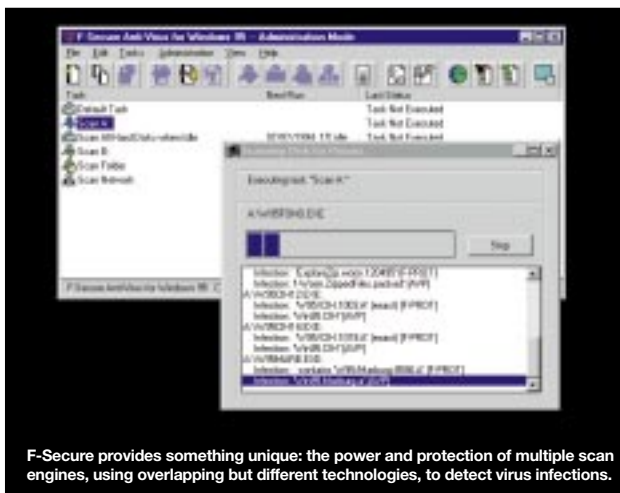
Documentation.....7

Effectiveness...Failed to detect two

.....executable 'viruses in the wild'

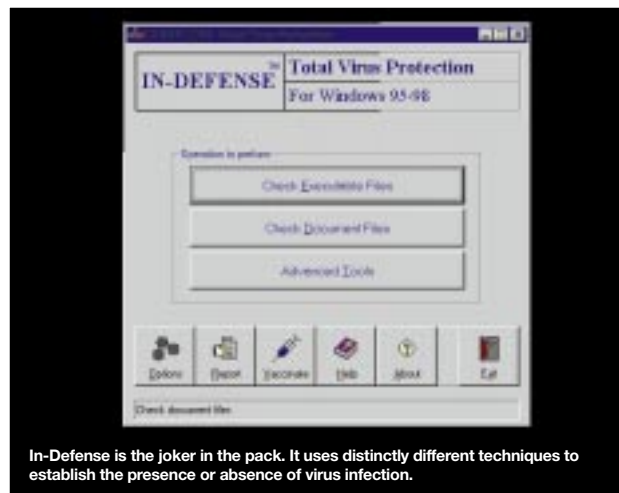
Value for money.....10

5/10

**PC Plus****F-SECURE  
ANTI-VIRUS 5.0.2**

F-Secure provides something unique: the power and protection of multiple scan engines, using overlapping but different technologies, to detect virus infections.

■ PRICE £106 ■ EX VAT £90 ■ SUPPLIER F-Secure ■ PHONE 01223 257 747

**IN-DEFENSE  
VIRUS PROTECTION SYSTEM 3.0**

In-Defense is the joker in the pack. It uses distinctly different techniques to establish the presence or absence of virus infection.

■ PRICE £51 ■ EX VAT £43 ■ SUPPLIER POW! Distribution ■ PHONE 01202 716 726

<http://f-secure.co.uk>

**A famous, reliable and easy to implement tool**

**F**-Secure is an interesting package, combining in its scanning power three different 'engines'. In effect this means that when you use it, you are consulting several different databases about locating and identifying virus signatures. At this point we must mention that one of the most distressing things about fighting against virus incursion is the phenomenon we call 'false positive', when part of some program looks like a virus but, in fact, is quite innocent. The theory is that if more than one anti-virus technology identifies a virus using quite independent means, then it almost certainly is not a 'false positive'. This can soak up many frustrating hours in investigation and still leave an administrator wondering how safe his data is.

F-Secure has a good record and its virus search engines (F-Prot and AVP), added to its own Orion engine, have excellent pedigrees. However, there is a down side to their use: some inexperienced operators may become very confused to see two different viruses named as infectors of the same program or macro. This arises because F-Prot and AVP do not have the same naming conventions. You guessed it – there are two major conventions out there in use.

Another disadvantage is that with two independent engines working, when you are free of viruses (hopefully the majority of the time) scanning is swift; but when many files have suddenly become infected, the scanning process will take a long time – nearly twice as long as any of its competitors here. This package is more sensitive to virus-like ability within code (heuristic scanning) and is known to report viruses which have already become defunct (there, but harmless and unable to spread). Depending on your circumstances, this may be very convenient, or rather less than convenient.

It should be noted that the research organisation around F-Secure is second to none, and rightly garners awards all the time: you are in the hands of experts when you use F-Secure anti-virus products, and afforded top notch technical support.

When you update the signature tables (virus information database) from the Internet, this package uses 'polite push', which provides good use of the bandwidth and minimises the time it occupies.

**PC Plus****VERDICT****F-SECURE ANTI-VIRUS 5.0.2**

*For Excellent pedigree*

*Against Documentation is good*

*Range of features*.....8

*Ease of operation*.....7

*Documentation*.....10

*Effectiveness*.....Detected all

*'viruses in the wild'*

*Value for money*.....6

**6/10**

[www.indefense.com](http://www.indefense.com)

**A product that breaks all the moulds**

**I**t wasn't all that long ago that we awarded In-Defense ten out of ten. There has been no change since then in this product's performance, but in this review we concentrate on some practicalities that put a different focus on matters.

If you are a hobbyist who primarily downloads files and programs, imports a few files and exchanges a few ideas with fellow hobbyists on the Internet, you need protection from viruses – and In-Defense will do the job admirably. If, however, you distribute information as well, including memos and letters electronically, you will probably feel a greater responsibility in regard to viruses. The difference is that In-Defense will identify that a file or program is infected and will prevent it from reproducing: it makes bold claims about this, even to the extent that it proclaims it will prevent infection from a new, previously unknown virus – and, so far, these claims have been amply justified.

However, this product will not help you identify the particular virus that is causing the problem. Knowing a virus can be of immense value in tracing its origin and preventing its spread. You may find that in the absence of anti-virus software, a whole bank of programs is passed to you that is infected. In-Defense will prevent you picking up this infection, but will not identify the problem, much less remove it. Infected programs become worthless.

In-Defense is a startling program (or actually, suite of several applets): many anti-virus researchers scoffed when the authors declared their intention to build this ultimate protection suite. It uses clever behaviour detectors and blockers so that it catches virus code as it tries to replicate. In this way, it has no need to identify which virus is present – just that it is behaving like a virus. This further simplifies the search, especially for polymorphics, which have no single identifying string.

In turn, this means that the only time In-Defense will ever have to be updated is when a brand new form of virus attack is invented – which has been (mercifully) rare. However, it must be recognised that In-Defense is defenceless against future Trojans which do not exploit physical cloning because they do not display any virus-like behaviour.

**PC Plus****VERDICT****IN-DEFENSE VIRUS  
PROTECTION SYSTEM 3.0**

*For Secure even without continual updates*

*Against Solves virus problems, but without identification*

*Range of features*.....8

*Ease of operation*.....10

*Documentation*.....7

*Effectiveness*.....Detected all

*'viruses in the wild'*

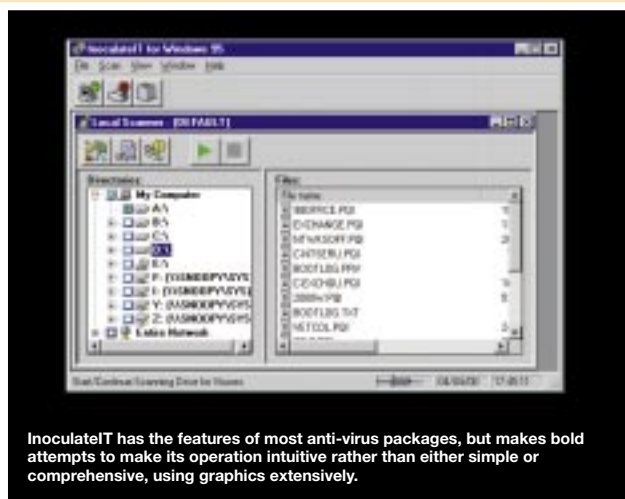
*Value for money*.....7

**7/10**

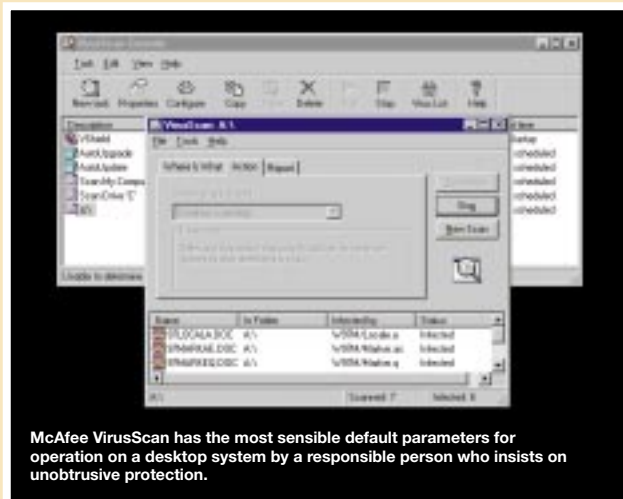


## COMPUTER ASSOCIATES INOCULATEIT PERSONAL EDITION

## MCAFEE VIRUSSCAN VERSION 5.00



InoculateIT has the features of most anti-virus packages, but makes bold attempts to make its operation intuitive rather than either simple or comprehensive, using graphics extensively.



McAfee VirusScan has the most sensible default parameters for operation on a desktop system by a responsible person who insists on unobtrusive protection.

■ PRICE Free for download ■ SUPPLIER Computer Associates ■ PHONE 01296 318 700

■ PRICE £25 ■ EX VAT £20 ■ SUPPLIER Network Associates ■ PHONE 01296 318 700

<http://antivirus.cai.com>

### Blends seamlessly with Windows

**I**noculateIT Personal Edition is a welcome product: it features a good professional scanner. Though not the most speedy, the on-demand scanner which is part of InoculateIT detected all of the viruses thrown at it and coped with them exactly as required.

An interesting feature we noted was that when scanning infected files, the scanner actually slowed down. This peculiar phenomenon is actually evidence of special care: once a virus infection is suspected or identified, steps are taken to ensure exactly what has happened and how repairs can be effected. We found that wherever there was a known solution that involved disinfecting a file (that is, cutting out the virus and rendering the program 'as original') InoculateIT performed the job precisely.

The rationale for Computer Associates making this product (and its updates from its Web site) free is that it believes that anti-virus software should be an integral part of system software on the PC. This is a visible phenomenon here: InoculateIT blends in with Windows excellently – virtually seamlessly. Extensive use of icons is evident everywhere and there is every attempt to make all movements, actions and operator decisions similar to those used for ordinary Windows maintenance. When choosing areas to scan, for example, the directory listing is eerily like that of the Windows browser.

This approach will obviously work for some people, making them feel more comfortable with anti-virus software, which is a good thing. However, the documentation lacks a great deal – perhaps with the idea that information should be disseminated on a 'need to know' basis.

As a result, we found that the icons became counter-intuitive: we had to move the mouse over icons to get information boxes that reminded us the purpose of each icon.

The Web site provides free updates (though it can take quite a time) and lots of information about viruses, including the latest attacks and how to deal with them. This service is excellent and deserves a look-in, even if you choose another anti-virus package.

There is a lot to be said in favour of this software (and the support Web site), but we felt it was badly let down by the low standard of documentation.

### PC Plus

#### VERDICT

##### COMPUTER ASSOCIATES INOCULATEIT PERSONAL EDITION

**For** Easy-to-use icons and menus; free

**Against** Not particularly fast

Range of features.....9

Ease of operation.....7

Documentation.....4

Effectiveness...Detected all 'viruses

There is a lot to be said in favour of this software (and the support Web site), but we felt it was badly let down by the low standard of documentation.

Value for money.....10

**6/10**

[www.mcafee.co.uk](http://www.mcafee.co.uk)

### Easy, cheap and secure

**T**he McAfee Anti-Virus suite has been known widely for many years, and has the trust of thousands of customers who have seen it develop as the forerunner of protection against viruses on the Internet. The VirusScan suite has won acclaim for its ease of installation and operation, and each change over the years has marked a welcome improvement.

The new version features an even simpler user interface than before, including one-button update of virus information from the Web. This is done incrementally, so that you don't have to download a large new file each time a change to the file is made. Such a feature means that the user can routinely log into the McAfee update site on a frequent basis without fearing that processing will be tied up for some considerable time.

For people who handle lots of different files from other destination, it can be important to isolate infected files and identify their source. If this is the policy you wish to employ, it is simple to set up through the interface. Automatic 'on-demand' scans of particular areas (for example, a download directory) can be set up more easily in VirusScan than in any of its rivals.

If you use cc:Mail, Eudora, Microsoft Exchange or Microsoft Outlook, you can set this package up so that viruses are detected even before delivery of the item containing the virus. Though some prefer to download and then scan downloads separately afterwards, this advanced preparation ensures that viruses are isolated before anybody can inadvertently pass them on – for example by copying.

This package takes a little longer to install on a standalone desktop than some others do, but it should be remembered that this is a one time operation.

The installation is both neat and simple: it does not suddenly demand policy decisions that had not been anticipated right in the middle, as some do.

Excellent advice is provided for neophytes: if you have never used an anti-virus package before, you could never find an easier one that is more effective. McAfee have a noted team of researchers working in labs around the world to provide emergency cover and to make updates available to all customers worldwide as soon as possible.

As expected, McAfee VirusScan successfully found and removed all the 'viruses in the wild'.



### PC Plus

#### VERDICT

##### MCAFEE VIRUSSCAN VERSION 5.00

**For** Easy to deploy using desired security policy

**Against** Not a lot

Range of features.....10

Ease of operation.....10

Documentation.....9

Effectiveness...Detected all 'viruses

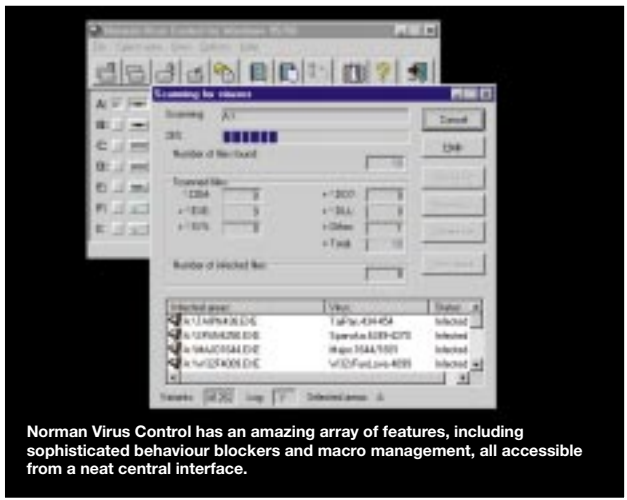
There is a lot to be said in favour of this software (and the support Web site), but we felt it was badly let down by the low standard of documentation.

Value for money.....10

**10/10**



# NORMAN VIRUS CONTROL 4.7



Norman Virus Control has an amazing array of features, including sophisticated behaviour blockers and macro management, all accessible from a neat central interface.

■ PRICE £47 ■ EX VAT £40 ■ SUPPLIER Norman Data Defense Systems ■ PHONE 01908 520 900

# PANDA ANTIVIRUS PLATINUM 6.0



Panda Antivirus provides a nice mix of icon and button operation, and we were very happy with the large scanned file summary accessible at all times during an on-demand scan.

■ PRICE £50 ■ EX VAT £42 ■ SUPPLIER Panda Software ■ PHONE 01372 824540

[www.normanuk.com](http://www.normanuk.com)

## This is a good all-round product

**T**he Norman Virus Control suite is a fine package of European descent, its pedigree includes the earliest successful implementations of heuristic scanning. When this package, long popular in its Norwegian home, matured and began to enjoy wider appreciation (not only in Europe but around the world) it was realised that heuristic scanning had also come of age, and ‘false positives’ – the anti-virus software equivalent of crying wolf – were a thing of the past. One of NVC’s ancestors had a nasty habit of ‘catching’ a lot of programs in development as well as rooting out pernicious viruses.

The scanner here is excellent: flexible and easy to operate, speedy and clear in its identification and diagnosis. There are three component sections of this suite: the ‘on demand’ scanner, the smart behaviour blocker (SBB) and ‘Cat’s Claw’. As already mentioned, the scanner is speedy because it uses heuristics effectively. Instead of a resident scanner that operates on each program when it is loaded for execution, Norman Virus Control relies on its smart behaviour blocker which inspects what is happening at various ports and software interfaces to detect behaviour that might be used by a virus.

Unfortunately, we found that some activities (on a development system where programming is regularly done) of the SBB interfered with smooth operation and so was selected ‘off’. This is not good practice because, at any particular moment, you will have no idea of the extent of virus protection afforded to your system.

Cat’s Claw, on the other hand, is so logical and useful that we will be surprised if more anti-virus packages do not develop a similar concept: it monitors what goes on with Word and Excel type macro viruses and selectively traps changes to those you do not want to have changed. We have actually found Cat’s Claw to be a friendly and convenient safeguard against accidental changes as well as macro viruses. Whenever anybody sends you a DOC, you must be aware that editing it in any way may cause you to ‘inherit’ macros and type categories that the letter writer may have had in his NORMAL.DOT. Cat’s Claw will protect your templates against these unwarranted changes.

**PC Plus**

**VERDICT**

**NORMAN VIRUS CONTROL 4.7**  
*For Interesting extra features; excellent service care*  
**Against Some circumstances require features to be bypassed**  
Range of features.....9  
Ease of operation.....9  
Documentation.....9  
Effectiveness.....Detected all ‘viruses in the wild’  
Value for money.....9

**9/10**

[www.pandasoftware.com](http://www.pandasoftware.com)

## A good package with great safeguards

**P**anda Antivirus Platinum 6.0 is a sound product, featuring all the usual components, such as behaviour blocking on incoming e-mail attachments and ‘on demand’ scanning. There are four overwhelming differences about this product when measured by the standards set in this roundup: two of them bode well for this package, and two of them poorly.

First, installation and maintenance are greatly enhanced by wizards. This is valuable, especially where an operator unacquainted with anti-virus measures is the one banging the keys. We believe firmly that routine jobs – especially those that may be fairly rare or not of directly seen interest to the operator – should be supervised by such wizards.

Second, Panda seems to have gone to some length to make sure that the next person in line – the one receiving output from you – is protected from picking up a virus infection from your PC. This is an excellent safeguard, though a bit annoying when you are intentionally working with viruses. But again, that is not what you normally want to do.

Third, scanning with Panda is dramatically slower than with some of the other packages reviewed here, though its success in finding and dealing with the viruses we threw at it was no different.

Fourth, we followed instructions but found no way to create an ‘overall default’ for scans. That is, each time we went to create a new ‘on demand’ scan we found that we had to select our desired defaults afresh.

One of the fascinating features that makes this a useful product is that it is particularly easy to tailor it: its language, warnings, behaviour when it finds a virus infection and alarms are all configurable to some extent.

Another welcome fact is that the price, though steeper than some reviewed here, is a lifetime price and you are accorded a lifelong license to update the product from the Web.

The documentation is excellent and consistently sound advice and direction is provided by the Help system. The integration of the package into Windows itself is great and, aside from the one niggling problem (number four above), operation is smooth.

**PC Plus**

**VERDICT**

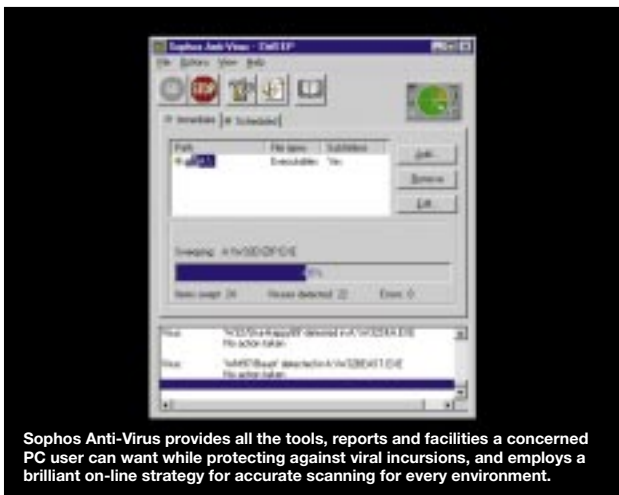
**PANDA ANTIVIRUS PLATINUM 6.0**  
*For Excellent ideas to prevent accidentally infecting others*  
**Against Easy but clumsy to set up default policy for dealing with viruses**  
Range of features.....7  
Ease of operation.....8  
Documentation.....10  
Effectiveness.....Detected all ‘viruses in the wild’  
Value for money.....8

**7/10**



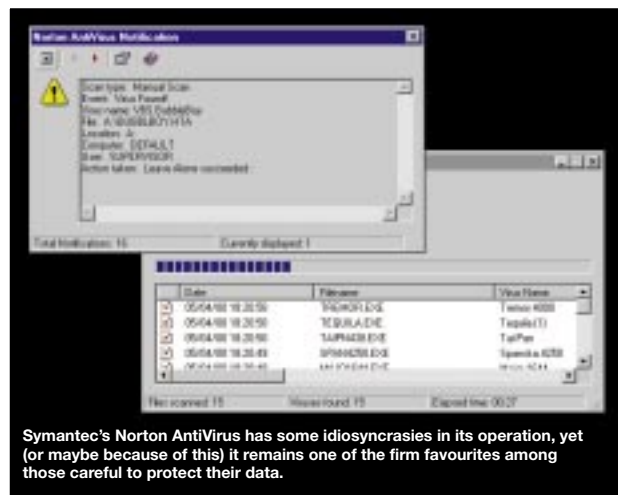


## PC Plus

SOPHOS  
ANTI-VIRUS

Sophos Anti-Virus provides all the tools, reports and facilities a concerned PC user can want while protecting against viral incursions, and employs a brilliant on-line strategy for accurate scanning for every environment.

PRICE £118 ■ EX VAT £100 ■ SUPPLIER Sophos ■ PHONE 01235 559 933

SYMANTEC  
NORTON ANTIVIRUS 2000 6.0

Symantec's Norton AntiVirus has some idiosyncrasies in its operation, yet (or maybe because of this) it remains one of the firm favourites among those careful to protect their data.

PRICE £42 ■ EX VAT £36 ■ SUPPLIER Symantec (UK) Ltd ■ PHONE 0207 616 5600

[www.sophos.com](http://www.sophos.com)

## Industrial strength security on your standalone

**S**ophos Antivirus is a suite with a long history in the UK, stretching back to the time when the virus threat was hardly realised and solutions to virus infestations were provided as individual modules to deal with each virus (or a cluster of similar viruses). As a result, the Sophos expertise covers a great deal and their experts understand both the nature and implications of viruses more than many others. The Sophos strategy is different from that of the run of the mill anti-virus suite: there are two major components that do the whole job.

The first is Sweep, a standalone scanner that, besides doing 'on demand' scans of selected areas on selected drives, will happily perform scheduled scans that you can arrange for when the PC is unlikely to have heavy use.

The second component is Intercheck – a clever, multipurpose solution to major headaches for anti-virus experts over the years. Its basic function is to do 'on-access' scanning. Previously (and to varying extents, today) virus experts in various companies tackled the problem of delivering 'on-access' protection by providing a small module that stayed resident, and added itself to the processing queue whenever a program was loaded. At first this was practical (though from the beginning there were ways a 'smart' virus could short-circuit such a move) but eventually the complex array of weaponry exhibited in advanced viruses became too much to deal with in a resident module.

Intercheck is a complete program – a VxD (a technology that first appeared with Win95). It works by communicating with a tiny routine that, as the program loads into memory, passes chunks of it as data back to Intercheck, which is able to do a full, unlimited scan and analysis of the reassembled program, and pass its verdict back to the system. The true beauty of Intercheck is that this same technology, now proven, can do the same fully competent scan of e-mail, OLE attachments, and the like, and can do it on networks and from servers just as easily as in the background to a single desktop.

Sophos provides bound manuals and reference materials as well as on-line help. Besides anytime Web updates, Sophos still provides optional monthly updates (plus urgent interim updates) which are useful in many circumstances.

## PC Plus

## VERDICT

## SOPHOS ANTI-VIRUS

*For Secure and flexible. It will grow with your configuration*

*Against Expensive for a single desktop, though warranted*

Range of features.....9

Ease of operation.....10

Documentation.....10

Effectiveness.....Detected all 'viruses

.....in the wild'

Value for money.....8

9/10

[www.symantec.co.uk](http://www.symantec.co.uk)

## A formidable package of anti-virus strategies

**N**orton Antivirus is a handsome package and, along with McAfee VirusScan, often sits at the top of the pile glowing from the adoration it gets from the public. Norton Antivirus is a comprehensive suite that protects your data against executable viruses, boot viruses, macro viruses and Trojans and will automatically scan incoming mail via the most popular mail programs (Eudora, Netscape Mail, Microsoft Outlook and the like), protecting you against viruses at the first port of entry.

If you leave Java turned on (permitting Java applets to run) or allow ActiveX scripts be careful – both are prone to potentially involve malicious code which can easily gain entry through execution by your Internet browser (such as Internet Explorer 4 or 5). Antivirus 2000 6.0 features the ability to isolate ('quarantined') an infected program so that it can be left on the system for later retrieval and analysis without the operator accidentally triggering infection in the meantime.

In all sorts of ways you can see the similarity between Antivirus 2000 6.0 and its main rival, Network Associates' McAfee VirusScan. On this occasion we had no strong complaint about either but Norton was tripped up, in our opinion, by providing rather awkward and less than sensible default options for scans.

Symantec provides an excellent service on its Web site documenting viruses thoroughly and providing speedy analysis of new suspected viruses caught and 'quarantined' by vigilant customers. Updates of the virus information database can be readily downloaded from this site. Norton Antivirus features heuristic searching as well, using technology it colourfully calls 'Bloodhound'.

Among the welcome details in this product is that if you have gone a considerable time without updating the virus signature database, you will be warned and a wizard will urge you to do so immediately, guiding you through the process. There is a nice mix of narration and intuitive icons, supervised by a wizard, guiding the user through the process of dealing with an infection manually when it does occur. Of course, you can elect to have the suite deal with the virus automatically, selecting the method in advance.

## PC Plus

## VERDICT

NORTON ANTIVIRUS  
2000 6.0

*For Excellent service care; range of features*

*Against Awkward default scan options; can be confusing*

Range of features.....9

Ease of operation.....6

Documentation.....9

Effectiveness.....Detected all

'viruses in the wild'

Value for money.....8

7/10



# The tests

## How we tested the ten anti-virus packages

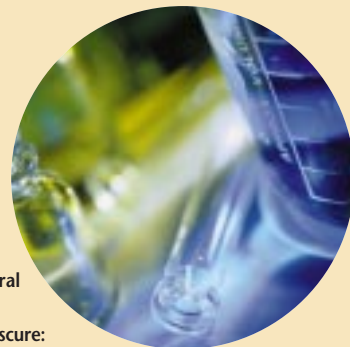
**W**e took ten well known anti-virus packages and tested their on-demand scanners against many of the most successful viruses 'in the wild' today, using the world famous facilities of West Coast Publishing in Neath near Swansea. It publishes SC Magazine, devoted to computer security issues and also operates one of the best known certification schemes, guaranteeing that the anti-virus package vendors are selling products that work.

We tested the 'on-demand' scanner, designed to look through programs and files for signs of viral infection in each of the ten packages. Though most of these packages are built in several versions, the one we tested was the standalone Win98 version (except, for technical reasons, In-Defense, for which we used the standalone NT version).

The 'in the wild' collection of viruses is continually updated by West Coast, with the co-operation of anti-virus researchers around the world. At the breakpoint at which we tested, it had been updated to January 2000. It consisted of 48 totally different EXE-type viruses; 36 Word97 viruses; 32 Office97 viruses; 27 Office95 viruses; and 12 Excel97 viruses. In many cases, each virus represents several similar viruses.

We were strict. These viruses are not obscure:

you may run into one of them later today. So we decided to give each package a 100 per cent rating – or report that it failed – for your sake, and for the safety of your data.



### SAFE PRACTICE

## Know your enemy

*The Internet is now, unquestionably, the primary medium for the spread of viruses – especially when you add e-mails to the equation*

**1** The EXE (or COM) virus, that latches on to an executable program and installs itself as if it were a subroutine of that program. Whenever you run an infected program, the virus 'routine' does its dirty work, writing its infection into other COM or EXE programs. The virus actually spreads from program to program. Bootleg programs (especially games) are especially prone to this type of virus because so many people handled them; eventually somebody will infect it (accidentally, of course) because they keep a copy on a machine where the virus is thriving.

**2** The boot virus, that is linked into the bootstrap program on a floppy disk (potentially there, even if it is not a system disk). This type relies on somebody forgetting that they have a floppy in the drive when they reboot their PC. Sloppy operators 'correct' their mistake by popping the floppy and pressing any key to proceed – but the virus has already been booted into memory and will happily now infect the master boot record of the hard disk. Interestingly, until just the last few years, this type of virus – relying on bad operational habits – was by far the most commonly seen.

**3** Windows nearly spelled the end of the EXE virus: many of them will not even reproduce because of some slight system differences between the old 'real' DOS and the new Windows-enhanced version. But before long, the creative cretins returned, having

winkled out loopholes and weaknesses within Windows itself. Then a few years ago, somebody stumbled on a new wheeze: macros in packages like Word and Excel are actually little programs, and Microsoft had provided the Basic-like macro language they employed with some pretty powerful instructions. So powerful that, in theory, a macro virus can be constructed. Soon the theory became practice and now we see non-executables (such as Word documents) that can be infected. Usually these work by infecting the default template, which is a macro itself. Then whenever Word is run, it puts the infected macro code (part of the default template) into every subsequent document created or edited.

**4** It seems that people like animated and colourful e-mail and interactive Web sites. These are two of the more recently exploited opportunities for viral infections. HTML is downloaded for arty e-mail (instead of text) and the unwary may execute it, without realising that HTML can invoke programs and applets already downloaded to your computer. Not only that, but you have to go to some effort to stop Outlook from being so 'helpful', executing an infected applet without stopping to give you a choice in the matter. Java and other miniature languages may be insecure as well: the wise operator thinks twice before trusting an applet from an unknown site.

**5** You should never forget about other nefarious programs. Some are not strictly

viruses but deserve the same attention. Among these are Trojans – programs that, like the Trojan Horse, promise one thing but deliver another; they smuggle their trick on to your system without your knowing it. Another type is the worm. This is virus-like, but does not duplicate itself: it lets the Internet do that, simply by arranging that it gets sent as an attachment to everybody in your Outlook address book (or some similar method).

A good anti-virus package will be looking out for all of these, and be adaptable to monitoring your system for future incursions. But there are several simple, commonsense rules to keep your data and programs uninfected and reasonably safe:

- Invest in a good anti-virus product.
- Keep it up-to-date; the greatest threat comes from current viruses – not old ones.
- Use good judgment and cultivate careful habits when handling data; don't handle bootleg software; don't leave floppies in drives after their use.
- Consider preventing Internet applets running unless you are certain of the owner of the Web site.
- Never EVER execute a new program, whatever its source, without an anti-virus scan.
- Be on the lookout for unknown macros that appear on your system after downloading files.
- When possible, pass RTF files rather than DOC files; they are not subject to infection.
- If you ever find your system infected, DO NOT PANIC; you are much more likely to compound the problem than solve it.

## Internet updating

*Most anti-virus suites now feature updating via the Internet. This is not only convenient, it is more secure*

**A**nti-virus packages have to be routinely updated so that they can identify viruses and, since new viruses are being introduced all the time, your purchase will be out of date almost immediately: you should, immediately after installation, update the package and then on a regular basis (say every fortnight) repeat the process.

For those without access to the Internet – or in more complex configurations – it may be desirable to obtain an update on floppy or CD on a regular basis (many anti-virus suites are updated in this way monthly or quarterly). But updating from the Internet has the advantage that, in an emergency, all users can be kept up to date: last year the virus/worm Melissa spread so fast that many large companies were caught out between updates. With updates from the Internet it is important that they be done frequently and that it be diarised.

Just as you benefit from the ability to update immediately, so all computer users can benefit from your cooperation when dealing with viral vermin: notify the vendor of your anti-virus software so that the research and support team can tell where viruses are hitting, and which are troubling the community. In case the software does not completely correct your plight, the support team will be happy to be able to reassure you, giving good advice about how to rid yourself of a particular virus.

As you look at anti-virus packages, you may find one or two that incorporate 'push' technology. These arrange to download new virus identification files almost invisibly. Whenever you connect with a port on the Internet, the bandwidth is shared with an automatic download to your hard disk of updated virus information (often called 'signatures'). If this happens, you are best advised to check periodically, from the virus package's 'control panel', that the last update that has been incorporated and keep record of it in a diary.

If you are part of a network, it may be that the virus information is held elsewhere – on a server, so that all workstations get the same information. You have individual responsibility for and interest in the data on your workstation's disk, so we advise you to familiarise yourself with information about when updating is performed.



# PC Plus Verdict

## ANALYSIS

### The winners

**I**t was a tough call: we chose for review ten renowned anti-virus products, all proven suppliers with excellent track records. And to be honest, we could recommend almost any of them, and pick a few holes in each about what we think could be done better.

It took years to convince people that seat belts in cars were a good thing: in the same way computer users seem unready to protect themselves with anti-virus software. This means that the simplest yet most effective software is likely to be most useful, especially to the single user; it doesn't take a long time to do its job, and makes no big demands on the operator. Yet if a virus ever attacks, it is dispatched immediately.

The two packages amongst the ten that we chose as best are consistent award winners, yet quite different from each other: they both caught all the viruses we exposed to them, and both feature easy installation, sensible operation, good documentation, total support and frequent updating.

*With so many excellent software packages available, which do we recommend?*

## BEST VALUE

### MCAFFEE VIRUSSCAN VERSION 5.00

■ PRICE £25 ■ EX VAT £20 ■ SUPPLIER Network Associates ■ PHONE 01296 318 700 ■ WEB [www.mcafee.co.uk](http://www.mcafee.co.uk)

**T**he McAfee VirusScan package is our choice this time around: its product is simple to install and run, non-obtrusive, inexpensive and effective. Long one of the most popular anti-virus packages and best known, the expertise behind it is great and its pedigree is impressive. Its newest version includes the award-winning straightforward interface with the brilliant and speedy scanning engine developed by Dr Solomon's, now a component company of the same parent. The brilliant way that updates are handled (selectively on the Internet) will encourage effective use of the protection it affords: there is no time penalty in going to the McAfee update site often – say once a day.

A brilliant little feature we liked was the automatic saving of Word and similar documents in a secure directory on disk, so that you have a means of restoring them if a macro virus strikes in the interim.



Some may not like the futuristic design of McAfee's latest central activity monitor but the features, the simplicity, the speed, the accuracy will win you over.

## LATEST VIRUS

### Love hurts

While this issue was in preparation, the LoveLetter (or Love Bug) virus struck widely around the world. It is a type called a 'worm', reproducing not by a programming trick, but by sending itself to just about all the addresses in your mail-reader's address book. E-mail itself cannot do this: the culprit is actually a 'script' (in Visual Basic for Applications, used normally for macros in Word, Excel and so on), sent as an attachment to e-mail.

This worm, like the similar Melissa in 1999, spreads so effectively that it infects the Web before anti-virus experts have even seen it, let alone worked out a counter-strategy. It is in cases like this that behaviour blockers may sound the warning, while classical scanners see nothing wrong – until they are updated.

There are some lessons to be learned here:

1. Be suspicious of executable attachments to e-mail, even if you know the sender – but especially if you don't know and trust the sender.
2. Keep informed about new viruses – not from rumours by friends or colleagues, but from the anti-virus specialists.
3. If you hear of a virus, consult the Web site of one of the experts: many of those listed in this article have late breaking news. It's also worth going to [www.hoaxkill.com](http://www.hoaxkill.com), which aims to identify and root out pointless rumours about viruses.

## BEST PERFORMANCE

### SOPHOS ANTI-VIRUS

■ PRICE £118 ■ EX VAT £110 ■ SUPPLIER Sophos ■ PHONE 01235 559933 ■ WWW [www.sophos.com](http://www.sophos.com)

**T**he Sophos team has been noted for its conservatism: their experts are not prone to introducing a look or technology just because it is 'flavour of the month'. Indeed for many years their technicians were actually lampooned for resisting the implementation of a 'monitor'-type scan, activated only when a program was requisitioned for execution. Sophos continued to say that the reduced efficiency of this type of scanning is not worth the risk: that standalone 'on-demand' scanning was the answer. With the advent of the Web on to the desktop, monitor scanning became a near necessity, and Sophos invented 'Intercheck' – a distinctive solution, in which each loaded program is passed through a VxD module and, in effect, scanned with the full 'on-demand' scanner. This solution is accurate, surprisingly fast and adaptable to desktops, workstations, servers, networks and even whole enterprises. When experts leapfrog into a technical lead with a virtually totally secure solution like that, you have to take them at their word: they are on the lookout for the best and most secure precautions for your data.



The support provided by the Sophos team is not exceeded by its competitors, and every bit of information, every operation of the anti-virus package is geared to the best interests of the responsible PC user.



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# Protect and survive

Everybody should have virus protection – the Internet has made it more important than ever. **Wilf Hey** looks at the leading packages and gives them a thorough testing





## Group test: anti-virus software

**T**hey say ignorance is no excuse, and this is certainly true when it comes to coping with computer viruses. Even though a great deal of misinformation persists and scare stories abound, there is a real threat to the data and programs on your system from viruses – yet there are excellent software packages that are available now to make life simpler and easier. And they won't cost you an arm and a leg.

Viruses are tiny programs that attach themselves like a barnacle to another program and make themselves appear part of that program. When their code is executed, they create new copies of themselves to attach to yet more programs. About half of the known viruses do no more than this; the other half have a sting in their tale and perform some sort of 'trick'. This trick can be anything from a pair of eyes looking toward your mouse cursor, to a hidden routine that reformats your disk.

It should be noted that even 'innocuous' viruses are dangerous: even if it merely copies itself, any virus takes up space, slows down operations on the computer and still poses a potential threat whenever the operating system is modified – who

knows what hidden feature was exploited, and whether it is still there. Even more worrying is the fact that if you have 'caught' an unknown virus, you have no way of anticipating what might happen to your computer resources, and when. Ignoring a viral infection is like jumping from a tall building and musing a few feet above the pavement that everything is all right so far.

Unlike their biological counterpart, computer viruses do not spring into existence spontaneously. There is, unfortunately, a sort of person who thinks himself brilliant to be able to craft a virus – especially if it uses some 'secret' knowledge about the operating system. What results is a never-ending battle between the author of new viruses and the virus experts who strive to keep data safe, not only on global enterprise systems but on your own desktop or laptop PC.

The best strategies against viral attack are vigilance and intelligent, safe behaviour. It is important to keep up to date with the virus threat because new inroads are being made all the time. Much of the fight has moved from infected floppies to dangerous downloads: from contaminated EXEs to corrupted Word macros.



### TECHNICAL BRIEFING

## How a scanner works

*The typical anti-virus package consists of several parts. These may include the following:*

**1** An 'on-demand' scanner: this is a search program, which reads as data various files on a particular disk or part of a disk, and reports whether any of them contains code that suggests it has been infected by a known virus. The most sophisticated of this type of scanner will be able to do this with both EXE-type viruses and macro viruses, and also recognise slight variants of these viruses. It should be able to look inside ZIP (archived) files, and recognise polymorphic specimens.

**2** A scheduling feature, so that at specified times or after specified intervals a predefined 'on-demand' scan will be made. One common strategy is to create a scheduled scan that will inspect all the files and e-mails downloaded in their common areas.

**3** A monitor scan, which inspects each program just after it has been loaded, but before it has been executed. If virus code is found within its allocated memory, the program is not run, and a special

cancellation notice is raised. This is a line of defence that takes an extra few seconds each time a program is used, but prevents mishaps when running new programs. An alternative strategy is to make a 'snapshot' of the program: crucial information at the start and end, plus a checksum. The snapshot will only be made when the program is declared clean by the 'on-demand' scanner.

**4** Various routines that detect (and often block) certain behaviour: for example, when a disk is first accessed, its boot record will be inspected to confirm that it is uninfected. Memory can be scanned for remnants of a known virus still sitting in memory. Some anti-virus products look out for calls to special services that are unusual in normal operations, since they may be used to mask forbidden or dangerous activities.

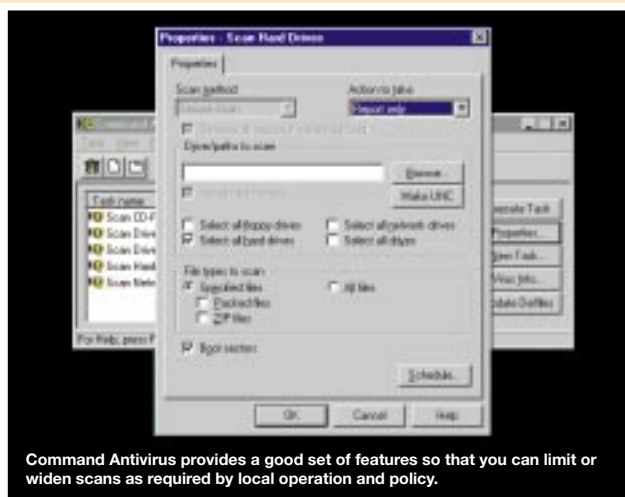
**5** Certain information about the symptoms and effects of various viruses, and information about how to remove them, is often available in the form

of a database or 'encyclopedia'. This is especially useful if you are passing on software or data to another location, and find an infection: it is not always good enough to rid yourself of a virus: it may be important to know how you were attacked, and by which virus.

Basically, a scanner works by searching through the physical bytes of a file looking for a string known to occur within a virus infection. Along with the string should be other pieces of information to help in its determination (for example, size of infection), all locked away in a database. The more powerful scanners must also handle virtual expansion of archived records (ZIP), and be on the lookout for self-encryption and code variation (such as dummy redundant instructions). One technique which appears in most scanners today is 'heuristic scanning', in which the scanner makes incidental notes about what it finds in a program – no hard evidence of a virus, but circumstantial evidence. If there is sufficient circumstantial evidence (based on a point score) the program is marked as 'probably infected with an unknown virus'.



## COMMAND ANTIVIRUS FOR WINDOWS 4.58



Command Antivirus provides a good set of features so that you can limit or widen scans as required by local operation and policy.

■ PRICE £59 download from Web ■ EX VAT £50 ■ SUPPLIER Command Software ■ PHONE 020 7931 9301

[www.command.co.uk](http://www.command.co.uk)

### A good package with 'early warning' and flexibility

**C**ommand Antivirus is notable as one of the first to prove in tests that it can reliably disinfect virus-ridden files (where possible) in connection with all 'viruses in the wild'. The technology behind this package primarily looks for virus-like behaviour, but then confirms the identity of a 'suspect' virus by checking for its distinctive 'signature'. What results is an extremely fast product that is still proficient at finding viruses and provides the bonus of being very good at pointing out the appearance of a suspected new virus.

The support staff at Command were delighted that their technology paid off with the outbreak of the 'Melissa' virus. This spread widely through the Web and was one of the first encounters to illustrate the need for detection of virus-like behaviour as well as identification – because now a successful virus can spread across the world before it has been analysed and countered by anti-virus researchers.

Command is easy to run when it has been intelligently set up, but we were disappointed with its default running, particularly the multiplicity of the policy decisions you have to make in order to set up options. In our opinion it needs a few good wizards explaining the consequences of setting the various options. Instead of that we found rather inadequate documentation.

In short, Command is a good and fast tool, well capable of being excellent anti-virus protection for your desktop (and it can boast the same of many configurations of networks as well), but rather lets itself down by becoming difficult for newcomers to the battle against viruses. If you are already familiar with what is expected of a seamless anti-virus suite, the Command may be just what you want.

Again, the scheduling of scans is remarkably adaptable and the nature of scans can be varied tremendously – too well, because it can become confusing. Not only that, but unfamiliarity with anti-virus measures can mean that an inexperienced user may well think he is being provided ultimate protection when he has, in fact, unwittingly compromised it with an inappropriate use of options.

#### PC Plus

##### VERDICT

#### COMMAND ANTIVIRUS FOR WINDOWS 4.58

*For Fast and efficient; flexible to suit needs*

*Against Badly let down in the area of documentation*

Range of features.....10

Ease of operation.....6

Documentation.....6

Effectiveness...Detected all 'viruses

.....in the wild'

Value for money.....7

6/10

## ALADDIN KNOWLEDGE SYSTEMS E-SAFE



E-Safe provides a particularly clear log of scans that it has executed and the precautions taken whenever it finds an infected file.

■ PRICE Free for download ■ SUPPLIER Aladdin ■ PHONE 01753 622 266

<http://ealaddin.com>

### Operation is eccentric: it's easy to bypass its power

**E**-Safe has, on occasions in the past, been successful while endeavouring to detect the 'viruses in the wild' collection, but it failed on this occasion to detect two of the known viruses presented to it. This package provides a means of setting up how the scanner should react to finding a virus. We did not feel that the default (though safe) was sensible – especially in light of fast infectors that may strike many files in a single directory virtually instantaneously. The default is to stop on each infection and demand a button push to continue – either to delete the file, leave it as is or to cancel the scan. This could radically disrupt time allocated to scanning maintenance and would probably demoralise a neophyte operator who should not be asked to render policy decisions. Another perplexing factor is that viruses that the package decides are 'removable' are assigned a different default from those it decides are 'not removable'. And the latter category, sadly, includes all viruses that infect executables, it decided.

The lack of complete accuracy may be a temporary glitch and may be rectified shortly but the inexplicable eccentricity of its operation makes this package one to be viewed carefully. We expect that anti-virus software for the desktop should be relatively simple and completely unobtrusive. Furthermore, in a larger environment (such as a network) it seems a very unwise thing to allow the operator of a workstation to make a policy decision that should have been made at a central location.

We could not work out an effective way to isolate a single file when it has been found infected – a safeguard that is a normal requirement of many security policies. The documentation was not much help in this regard.

There are some interesting features to this package and its scanning speed is good. Its hard reporting is impressive and it provides a useful summary of files scanned on the screen. It is quite possible that, given time, a user could come to grips with this package. It is not, at first glance, seamless and its default options for treating viruses are not sensible for the average user.

However, the price is right: for home desktop use, you can download a copy from the Aladdin Web site for free.

#### PC Plus

##### VERDICT

#### ALADDIN KNOWLEDGE SYSTEMS E-SAFE

*For Free*

*Against Operation unusual and not easy*

Range of features.....8

Ease of operation.....5

Documentation.....7

Effectiveness...Failed to detect two

.....executable 'viruses in the wild'

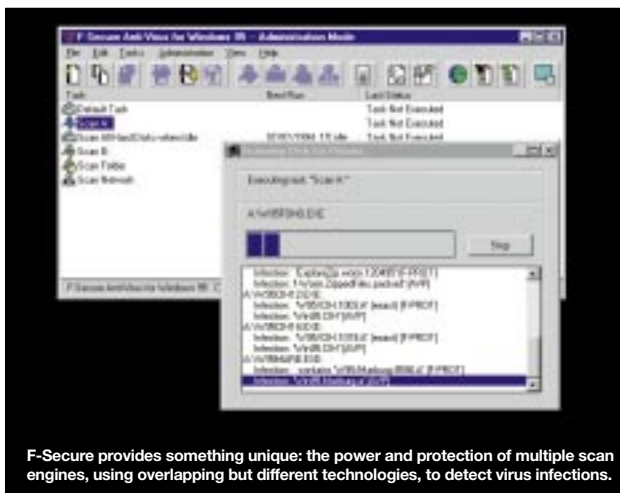
Value for money.....10

5/10



## PC Plus

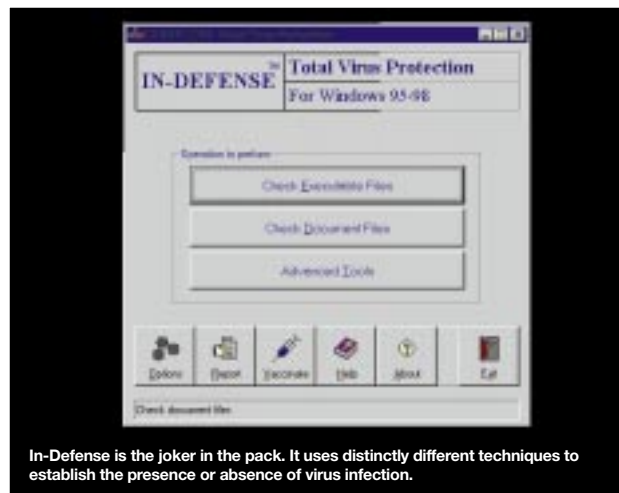
# F-SECURE ANTI-VIRUS 5.0.2



F-Secure provides something unique: the power and protection of multiple scan engines, using overlapping but different technologies, to detect virus infections.

PRICE £106 ■ EX VAT £90 ■ SUPPLIER F-Secure ■ PHONE 01223 257 747

# IN-DEFENSE VIRUS PROTECTION SYSTEM 3.0



In-Defense is the joker in the pack. It uses distinctly different techniques to establish the presence or absence of virus infection.

PRICE £51 ■ EX VAT £43 ■ SUPPLIER POW! Distribution ■ PHONE 01202 716 726

<http://f-secure.co.uk>

## A famous, reliable and easy to implement tool

**F**-Secure is an interesting package, combining in its scanning power three different 'engines'. In effect this means that when you use it, you are consulting several different databases about locating and identifying virus signatures. At this point we must mention that one of the most distressing things about fighting against virus incursion is the phenomenon we call 'false positive', when part of some program looks like a virus but, in fact, is quite innocent. The theory is that if more than one anti-virus technology identifies a virus using quite independent means, then it almost certainly is not a 'false positive'. This can soak up many frustrating hours in investigation and still leave an administrator wondering how safe his data is.

F-Secure has a good record and its virus search engines (F-Prot and AVP), added to its own Orion engine, have excellent pedigrees. However, there is a down side to their use: some inexperienced operators may become very confused to see two different viruses named as infectors of the same program or macro. This arises because F-Prot and AVP do not have the same naming conventions. You guessed it – there are two major conventions out there in use.

Another disadvantage is that with two independent engines working, when you are free of viruses (hopefully the majority of the time) scanning is swift; but when many files have suddenly become infected, the scanning process will take a long time – nearly twice as long as any of its competitors here. This package is more sensitive to virus-like ability within code (heuristic scanning) and is known to report viruses which have already become defunct (there, but harmless and unable to spread). Depending on your circumstances, this may be very convenient, or rather less than convenient.

It should be noted that the research organisation around F-Secure is second to none, and rightly garners awards all the time: you are in the hands of experts when you use F-Secure anti-virus products, and afforded top notch technical support.

When you update the signature tables (virus information database) from the Internet, this package uses 'polite push', which provides good use of the bandwidth and minimises the time it occupies.

## PC Plus

## VERDICT

## F-SECURE ANTI-VIRUS 5.0.2

For Excellent pedigree

Against Documentation is good

Range of features.....8

Ease of operation.....7

Documentation.....10

Effectiveness.....Detected all

'viruses in the wild'

Value for money.....6

6/10

[www.indefense.com](http://www.indefense.com)

## A product that breaks all the moulds

**I**t wasn't all that long ago that we awarded In-Defense ten out of ten. There has been no change since then in this product's performance, but in this review we concentrate on some practicalities that put a different focus on matters.

If you are a hobbyist who primarily downloads files and programs, imports a few files and exchanges a few ideas with fellow hobbyists on the Internet, you need protection from viruses – and In-Defense will do the job admirably. If, however, you distribute information as well, including memos and letters electronically, you will probably feel a greater responsibility in regard to viruses. The difference is that In-Defense will identify that a file or program is infected and will prevent it from reproducing: it makes bold claims about this, even to the extent that it proclaims it will prevent infection from a new, previously unknown virus – and, so far, these claims have been amply justified.

However, this product will not help you identify the particular virus that is causing the problem. Knowing a virus can be of immense value in tracing its origin and preventing its spread. You may find that in the absence of anti-virus software, a whole bank of programs is passed to you that is infected. In-Defense will prevent you picking up this infection, but will not identify the problem, much less remove it. Infected programs become worthless.

In-Defense is a startling program (or actually, suite of several applets): many anti-virus researchers scoffed when the authors declared their intention to build this ultimate protection suite. It uses clever behaviour detectors and blockers so that it catches virus code as it tries to replicate. In this way, it has no need to identify which virus is present – just that it is behaving like a virus. This further simplifies the search, especially for polymorphics, which have no single identifying string.

In turn, this means that the only time In-Defense will ever have to be updated is when a brand new form of virus attack is invented – which has been (mercifully) rare. However, it must be recognised that In-Defense is defenceless against future Trojans which do not exploit physical cloning because they do not display any virus-like behaviour.

## PC Plus

## VERDICT

## IN-DEFENSE VIRUS PROTECTION SYSTEM 3.0

For Secure even without continual updates

Against Solves virus problems, but without identification

Range of features.....8

Ease of operation.....10

Documentation.....7

Effectiveness.....Detected all

'viruses in the wild'

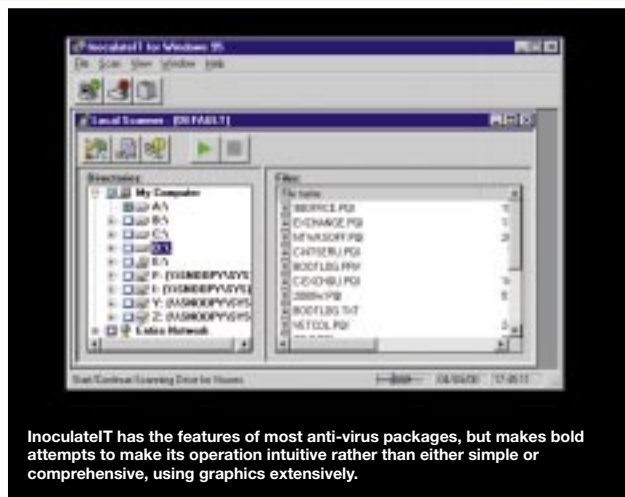
Value for money.....7

7/10

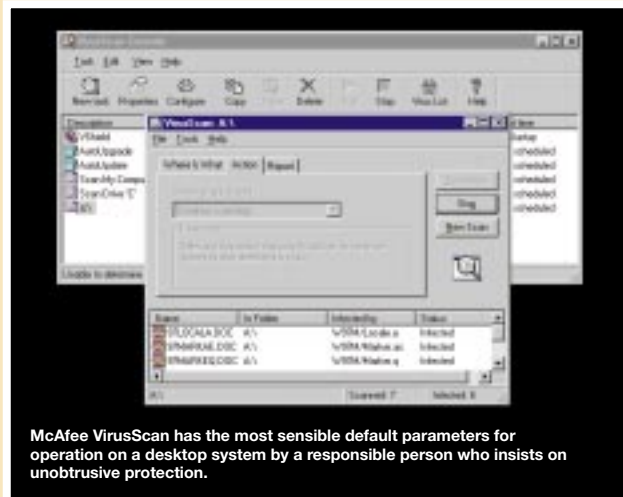


## COMPUTER ASSOCIATES INOCULATEIT PERSONAL EDITION

## MCAFEE VIRUSSCAN VERSION 5.00



InoculateIT has the features of most anti-virus packages, but makes bold attempts to make its operation intuitive rather than either simple or comprehensive, using graphics extensively.



McAfee VirusScan has the most sensible default parameters for operation on a desktop system by a responsible person who insists on unobtrusive protection.

■ PRICE Free for download ■ SUPPLIER Computer Associates ■ PHONE 01296 318 700

■ PRICE £25 ■ EX VAT £20 ■ SUPPLIER Network Associates ■ PHONE 01296 318 700

<http://antivirus.cai.com>

### Blends seamlessly with Windows

**I**noculateIT Personal Edition is a welcome product: it features a good professional scanner. Though not the most speedy, the on-demand scanner which is part of InoculateIT detected all of the viruses thrown at it and coped with them exactly as required.

An interesting feature we noted was that when scanning infected files, the scanner actually slowed down. This peculiar phenomenon is actually evidence of special care: once a virus infection is suspected or identified, steps are taken to ensure exactly what has happened and how repairs can be effected. We found that wherever there was a known solution that involved disinfecting a file (that is, cutting out the virus and rendering the program 'as original') InoculateIT performed the job precisely.

The rationale for Computer Associates making this product (and its updates from its Web site) free is that it believes that anti-virus software should be an integral part of system software on the PC. This is a visible phenomenon here: InoculateIT blends in with Windows excellently – virtually seamlessly. Extensive use of icons is evident everywhere and there is every attempt to make all movements, actions and operator decisions similar to those used for ordinary Windows maintenance. When choosing areas to scan, for example, the directory listing is eerily like that of the Windows browser.

This approach will obviously work for some people, making them feel more comfortable with anti-virus software, which is a good thing. However, the documentation lacks a great deal – perhaps with the idea that information should be disseminated on a 'need to know' basis.

As a result, we found that the icons became counter-intuitive: we had to move the mouse over icons to get information boxes that reminded us the purpose of each icon.

The Web site provides free updates (though it can take quite a time) and lots of information about viruses, including the latest attacks and how to deal with them. This service is excellent and deserves a look-in, even if you choose another anti-virus package.

There is a lot to be said in favour of this software (and the support Web site), but we felt it was badly let down by the low standard of documentation.

### PC Plus

#### VERDICT

##### COMPUTER ASSOCIATES INOCULATEIT PERSONAL EDITION

**For** Easy-to-use icons and menus; free

**Against** Not particularly fast

Range of features.....9

Ease of operation.....7

Documentation.....4

Effectiveness...Detected all 'viruses

There is a lot to be said in favour of this software (and the support Web site), but we felt it was badly let down by the low standard of documentation.

Value for money.....10

**6/10**

[www.mcafee.co.uk](http://www.mcafee.co.uk)

### Easy, cheap and secure

**T**he McAfee Anti-Virus suite has been known widely for many years, and has the trust of thousands of customers who have seen it develop as the forerunner of protection against viruses on the Internet. The VirusScan suite has won acclaim for its ease of installation and operation, and each change over the years has marked a welcome improvement.

The new version features an even simpler user interface than before, including one-button update of virus information from the Web. This is done incrementally, so that you don't have to download a large new file each time a change to the file is made. Such a feature means that the user can routinely log into the McAfee update site on a frequent basis without fearing that processing will be tied up for some considerable time.

For people who handle lots of different files from other destination, it can be important to isolate infected files and identify their source. If this is the policy you wish to employ, it is simple to set up through the interface. Automatic 'on-demand' scans of particular areas (for example, a download directory) can be set up more easily in VirusScan than in any of its rivals.

If you use cc:Mail, Eudora, Microsoft Exchange or Microsoft Outlook, you can set this package up so that viruses are detected even before delivery of the item containing the virus. Though some prefer to download and then scan downloads separately afterwards, this advanced preparation ensures that viruses are isolated before anybody can inadvertently pass them on – for example by copying.

This package takes a little longer to install on a standalone desktop than some others do, but it should be remembered that this is a one time operation.

The installation is both neat and simple: it does not suddenly demand policy decisions that had not been anticipated right in the middle, as some do.

Excellent advice is provided for neophytes: if you have never used an anti-virus package before, you could never find an easier one that is more effective. McAfee have a noted team of researchers working in labs around the world to provide emergency cover and to make updates available to all customers worldwide as soon as possible.

As expected, McAfee VirusScan successfully found and removed all the 'viruses in the wild'.

### PC Plus

#### VERDICT

##### MCAFEE VIRUSSCAN VERSION 5.00

**For** Easy to deploy using desired security policy

**Against** Not a lot

Range of features.....10

Ease of operation.....10

Documentation.....9

Effectiveness...Detected all 'viruses

There is a lot to be said in favour of this software (and the support Web site), but we felt it was badly let down by the low standard of documentation.

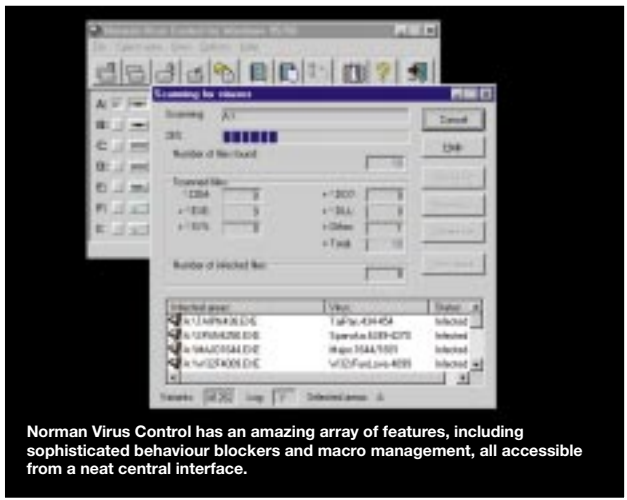
Value for money.....10

**10/10**





# NORMAN VIRUS CONTROL 4.7



Norman Virus Control has an amazing array of features, including sophisticated behaviour blockers and macro management, all accessible from a neat central interface.

■ PRICE £47 ■ EX VAT £40 ■ SUPPLIER Norman Data Defense Systems ■ PHONE 01908 520 900

# PANDA ANTIVIRUS PLATINUM 6.0



Panda Antivirus provides a nice mix of icon and button operation, and we were very happy with the large scanned file summary accessible at all times during an on-demand scan.

■ PRICE £50 ■ EX VAT £42 ■ SUPPLIER Panda Software ■ PHONE 01372 824540

[www.normanuk.com](http://www.normanuk.com)

## This is a good all-round product

**T**he Norman Virus Control suite is a fine package of European descent, its pedigree includes the earliest successful implementations of heuristic scanning. When this package, long popular in its Norwegian home, matured and began to enjoy wider appreciation (not only in Europe but around the world) it was realised that heuristic scanning had also come of age, and ‘false positives’ – the anti-virus software equivalent of crying wolf – were a thing of the past. One of NVC’s ancestors had a nasty habit of ‘catching’ a lot of programs in development as well as rooting out pernicious viruses.

The scanner here is excellent: flexible and easy to operate, speedy and clear in its identification and diagnosis. There are three component sections of this suite: the ‘on demand’ scanner, the smart behaviour blocker (SBB) and ‘Cat’s Claw’. As already mentioned, the scanner is speedy because it uses heuristics effectively. Instead of a resident scanner that operates on each program when it is loaded for execution, Norman Virus Control relies on its smart behaviour blocker which inspects what is happening at various ports and software interfaces to detect behaviour that might be used by a virus.

Unfortunately, we found that some activities (on a development system where programming is regularly done) of the SBB interfered with smooth operation and so was selected ‘off’. This is not good practice because, at any particular moment, you will have no idea of the extent of virus protection afforded to your system.

Cat’s Claw, on the other hand, is so logical and useful that we will be surprised if more anti-virus packages do not develop a similar concept: it monitors what goes on with Word and Excel type macro viruses and selectively traps changes to those you do not want to have changed. We have actually found Cat’s Claw to be a friendly and convenient safeguard against accidental changes as well as macro viruses. Whenever anybody sends you a DOC, you must be aware that editing it in any way may cause you to ‘inherit’ macros and type categories that the letter writer may have had in his NORMAL.DOT. Cat’s Claw will protect your templates against these unwarranted changes.

**PC Plus**

**VERDICT**

**NORMAN VIRUS CONTROL 4.7**  
*For Interesting extra features; excellent service care*  
**Against Some circumstances require features to be bypassed**  
Range of features.....9  
Ease of operation.....9  
Documentation.....9  
Effectiveness.....Detected all ‘viruses in the wild’  
Value for money.....9

**9/10**

[www.pandasoftware.com](http://www.pandasoftware.com)

## A good package with great safeguards

**P**anda Antivirus Platinum 6.0 is a sound product, featuring all the usual components, such as behaviour blocking on incoming e-mail attachments and ‘on demand’ scanning. There are four overwhelming differences about this product when measured by the standards set in this roundup: two of them bode well for this package, and two of them poorly.

First, installation and maintenance are greatly enhanced by wizards. This is valuable, especially where an operator unacquainted with anti-virus measures is the one banging the keys. We believe firmly that routine jobs – especially those that may be fairly rare or not of directly seen interest to the operator – should be supervised by such wizards.

Second, Panda seems to have gone to some length to make sure that the next person in line – the one receiving output from you – is protected from picking up a virus infection from your PC. This is an excellent safeguard, though a bit annoying when you are intentionally working with viruses. But again, that is not what you normally want to do.

Third, scanning with Panda is dramatically slower than with some of the other packages reviewed here, though its success in finding and dealing with the viruses we threw at it was no different.

Fourth, we followed instructions but found no way to create an ‘overall default’ for scans. That is, each time we went to create a new ‘on demand’ scan we found that we had to select our desired defaults afresh.

One of the fascinating features that makes this a useful product is that it is particularly easy to tailor it: its language, warnings, behaviour when it finds a virus infection and alarms are all configurable to some extent.

Another welcome fact is that the price, though steeper than some reviewed here, is a lifetime price and you are accorded a lifelong license to update the product from the Web.

The documentation is excellent and consistently sound advice and direction is provided by the Help system. The integration of the package into Windows itself is great and, aside from the one niggling problem (number four above), operation is smooth.

**PC Plus**

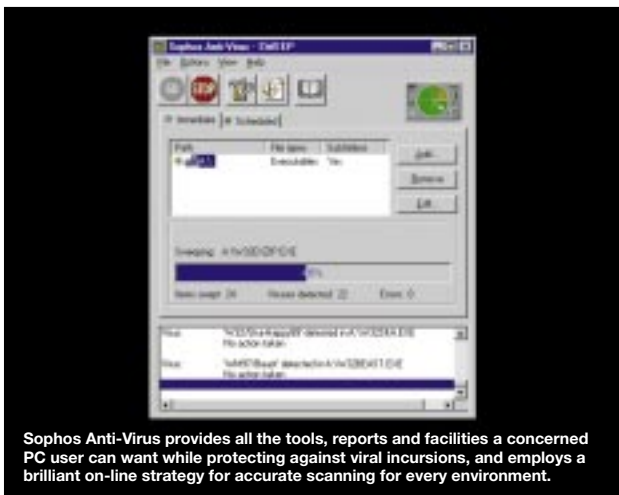
**VERDICT**

**PANDA ANTIVIRUS PLATINUM 6.0**  
*For Excellent ideas to prevent accidentally infecting others*  
**Against Easy but clumsy to set up default policy for dealing with viruses**  
Range of features.....7  
Ease of operation.....8  
Documentation.....10  
Effectiveness.....Detected all ‘viruses in the wild’  
Value for money.....8

**7/10**

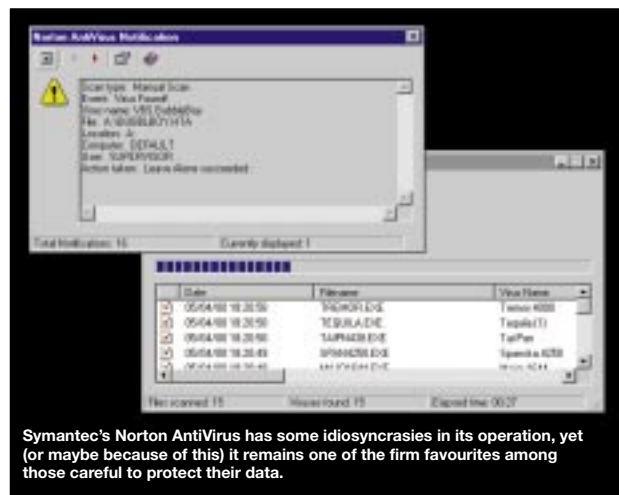


## PC Plus

SOPHOS  
ANTI-VIRUS

Sophos Anti-Virus provides all the tools, reports and facilities a concerned PC user can want while protecting against viral incursions, and employs a brilliant on-line strategy for accurate scanning for every environment.

PRICE £118 ■ EX VAT £100 ■ SUPPLIER Sophos ■ PHONE 01235 559 933

SYMANTEC  
NORTON ANTIVIRUS 2000 6.0

Symantec's Norton AntiVirus has some idiosyncrasies in its operation, yet (or maybe because of this) it remains one of the firm favourites among those careful to protect their data.

PRICE £42 ■ EX VAT £36 ■ SUPPLIER Symantec (UK) Ltd ■ PHONE 0207 616 5600

[www.sophos.com](http://www.sophos.com)

## Industrial strength security on your standalone

**S**ophos Antivirus is a suite with a long history in the UK, stretching back to the time when the virus threat was hardly realised and solutions to virus infestations were provided as individual modules to deal with each virus (or a cluster of similar viruses). As a result, the Sophos expertise covers a great deal and their experts understand both the nature and implications of viruses more than many others. The Sophos strategy is different from that of the run of the mill anti-virus suite: there are two major components that do the whole job.

The first is Sweep, a standalone scanner that, besides doing 'on demand' scans of selected areas on selected drives, will happily perform scheduled scans that you can arrange for when the PC is unlikely to have heavy use.

The second component is Intercheck – a clever, multipurpose solution to major headaches for anti-virus experts over the years. Its basic function is to do 'on-access' scanning. Previously (and to varying extents, today) virus experts in various companies tackled the problem of delivering 'on-access' protection by providing a small module that stayed resident, and added itself to the processing queue whenever a program was loaded. At first this was practical (though from the beginning there were ways a 'smart' virus could short-circuit such a move) but eventually the complex array of weaponry exhibited in advanced viruses became too much to deal with in a resident module.

Intercheck is a complete program – a VxD (a technology that first appeared with Win95). It works by communicating with a tiny routine that, as the program loads into memory, passes chunks of it as data back to Intercheck, which is able to do a full, unlimited scan and analysis of the reassembled program, and pass its verdict back to the system. The true beauty of Intercheck is that this same technology, now proven, can do the same fully competent scan of e-mail, OLE attachments, and the like, and can do it on networks and from servers just as easily as in the background to a single desktop.

Sophos provides bound manuals and reference materials as well as on-line help. Besides anytime Web updates, Sophos still provides optional monthly updates (plus urgent interim updates) which are useful in many circumstances.

## PC Plus

## VERDICT

## SOPHOS ANTI-VIRUS

*For Secure and flexible. It will grow with your configuration*

*Against Expensive for a single desktop, though warranted*

Range of features.....9

Ease of operation.....10

Documentation.....10

Effectiveness.....Detected all 'viruses

.....in the wild'

Value for money.....8

9/10

[www.symantec.co.uk](http://www.symantec.co.uk)

## A formidable package of anti-virus strategies

**N**orton Antivirus is a handsome package and, along with McAfee VirusScan, often sits at the top of the pile glowing from the adoration it gets from the public. Norton Antivirus is a comprehensive suite that protects your data against executable viruses, boot viruses, macro viruses and Trojans and will automatically scan incoming mail via the most popular mail programs (Eudora, Netscape Mail, Microsoft Outlook and the like), protecting you against viruses at the first port of entry.

If you leave Java turned on (permitting Java applets to run) or allow ActiveX scripts be careful – both are prone to potentially involve malicious code which can easily gain entry through execution by your Internet browser (such as Internet Explorer 4 or 5). Antivirus 2000 6.0 features the ability to isolate ('quarantined') an infected program so that it can be left on the system for later retrieval and analysis without the operator accidentally triggering infection in the meantime.

In all sorts of ways you can see the similarity between Antivirus 2000 6.0 and its main rival, Network Associates' McAfee VirusScan. On this occasion we had no strong complaint about either but Norton was tripped up, in our opinion, by providing rather awkward and less than sensible default options for scans.

Symantec provides an excellent service on its Web site documenting viruses thoroughly and providing speedy analysis of new suspected viruses caught and 'quarantined' by vigilant customers. Updates of the virus information database can be readily downloaded from this site. Norton Antivirus features heuristic searching as well, using technology it colourfully calls 'Bloodhound'.

Among the welcome details in this product is that if you have gone a considerable time without updating the virus signature database, you will be warned and a wizard will urge you to do so immediately, guiding you through the process. There is a nice mix of narration and intuitive icons, supervised by a wizard, guiding the user through the process of dealing with an infection manually when it does occur. Of course, you can elect to have the suite deal with the virus automatically, selecting the method in advance.

## PC Plus

## VERDICT

NORTON ANTIVIRUS  
2000 6.0

*For Excellent service care; range of features*

*Against Awkward default scan options; can be confusing*

Range of features.....9

Ease of operation.....6

Documentation.....9

Effectiveness.....Detected all

'viruses in the wild'

Value for money.....8

7/10



# The tests

## How we tested the ten anti-virus packages

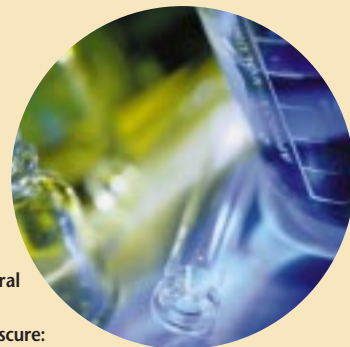
**W**e took ten well known anti-virus packages and tested their on-demand scanners against many of the most successful viruses 'in the wild' today, using the world famous facilities of West Coast Publishing in Neath near Swansea. It publishes SC Magazine, devoted to computer security issues and also operates one of the best known certification schemes, guaranteeing that the anti-virus package vendors are selling products that work.

We tested the 'on-demand' scanner, designed to look through programs and files for signs of viral infection in each of the ten packages. Though most of these packages are built in several versions, the one we tested was the standalone Win98 version (except, for technical reasons, In-Defense, for which we used the standalone NT version).

The 'in the wild' collection of viruses is continually updated by West Coast, with the co-operation of anti-virus researchers around the world. At the breakpoint at which we tested, it had been updated to January 2000. It consisted of 48 totally different EXE-type viruses; 36 Word97 viruses; 32 Office97 viruses; 27 Office95 viruses; and 12 Excel97 viruses. In many cases, each virus represents several similar viruses.

We were strict. These viruses are not obscure:

you may run into one of them later today. So we decided to give each package a 100 per cent rating – or report that it failed – for your sake, and for the safety of your data.



### SAFE PRACTICE

## Know your enemy

*The Internet is now, unquestionably, the primary medium for the spread of viruses – especially when you add e-mails to the equation*

**1** The EXE (or COM) virus, that latches on to an executable program and installs itself as if it were a subroutine of that program. Whenever you run an infected program, the virus 'routine' does its dirty work, writing its infection into other COM or EXE programs. The virus actually spreads from program to program. Bootleg programs (especially games) are especially prone to this type of virus because so many people handled them; eventually somebody will infect it (accidentally, of course) because they keep a copy on a machine where the virus is thriving.

**2** The boot virus, that is linked into the bootstrap program on a floppy disk (potentially there, even if it is not a system disk). This type relies on somebody forgetting that they have a floppy in the drive when they reboot their PC. Sloppy operators 'correct' their mistake by popping the floppy and pressing any key to proceed – but the virus has already been booted into memory and will happily now infect the master boot record of the hard disk. Interestingly, until just the last few years, this type of virus – relying on bad operational habits – was by far the most commonly seen.

**3** Windows nearly spelled the end of the EXE virus: many of them will not even reproduce because of some slight system differences between the old 'real' DOS and the new Windows-enhanced version. But before long, the creative cretins returned, having

winkled out loopholes and weaknesses within Windows itself. Then a few years ago, somebody stumbled on a new wheeze: macros in packages like Word and Excel are actually little programs, and Microsoft had provided the Basic-like macro language they employed with some pretty powerful instructions. So powerful that, in theory, a macro virus can be constructed. Soon the theory became practice and now we see non-executables (such as Word documents) that can be infected. Usually these work by infecting the default template, which is a macro itself. Then whenever Word is run, it puts the infected macro code (part of the default template) into every subsequent document created or edited.

**4** It seems that people like animated and colourful e-mail and interactive Web sites. These are two of the more recently exploited opportunities for viral infections. HTML is downloaded for arty e-mail (instead of text) and the unwary may execute it, without realising that HTML can invoke programs and applets already downloaded to your computer. Not only that, but you have to go to some effort to stop Outlook from being so 'helpful', executing an infected applet without stopping to give you a choice in the matter. Java and other miniature languages may be insecure as well: the wise operator thinks twice before trusting an applet from an unknown site.

**5** You should never forget about other nefarious programs. Some are not strictly

viruses but deserve the same attention. Among these are Trojans – programs that, like the Trojan Horse, promise one thing but deliver another; they smuggle their trick on to your system without your knowing it. Another type is the worm. This is virus-like, but does not duplicate itself: it lets the Internet do that, simply by arranging that it gets sent as an attachment to everybody in your Outlook address book (or some similar method).

A good anti-virus package will be looking out for all of these, and be adaptable to monitoring your system for future incursions. But there are several simple, commonsense rules to keep your data and programs uninfected and reasonably safe:

- Invest in a good anti-virus product.
- Keep it up-to-date; the greatest threat comes from current viruses – not old ones.
- Use good judgment and cultivate careful habits when handling data; don't handle bootleg software; don't leave floppies in drives after their use.
- Consider preventing Internet applets running unless you are certain of the owner of the Web site.
- Never EVER execute a new program, whatever its source, without an anti-virus scan.
- Be on the lookout for unknown macros that appear on your system after downloading files.
- When possible, pass RTF files rather than DOC files; they are not subject to infection.
- If you ever find your system infected, DO NOT PANIC; you are much more likely to compound the problem than solve it.

## Internet updating

*Most anti-virus suites now feature updating via the Internet. This is not only convenient, it is more secure*

**A**nti-virus packages have to be routinely updated so that they can identify viruses and, since new viruses are being introduced all the time, your purchase will be out of date almost immediately: you should, immediately after installation, update the package and then on a regular basis (say every fortnight) repeat the process.

For those without access to the Internet – or in more complex configurations – it may be desirable to obtain an update on floppy or CD on a regular basis (many anti-virus suites are updated in this way monthly or quarterly). But updating from the Internet has the advantage that, in an emergency, all users can be kept up to date: last year the virus/worm Melissa spread so fast that many large companies were caught out between updates. With updates from the Internet it is important that they be done frequently and that it be diarised.

Just as you benefit from the ability to update immediately, so all computer users can benefit from your cooperation when dealing with viral vermin: notify the vendor of your anti-virus software so that the research and support team can tell where viruses are hitting, and which are troubling the community. In case the software does not completely correct your plight, the support team will be happy to be able to reassure you, giving good advice about how to rid yourself of a particular virus.

As you look at anti-virus packages, you may find one or two that incorporate 'push' technology. These arrange to download new virus identification files almost invisibly. Whenever you connect with a port on the Internet, the bandwidth is shared with an automatic download to your hard disk of updated virus information (often called 'signatures'). If this happens, you are best advised to check periodically, from the virus package's 'control panel', that the last update that has been incorporated and keep record of it in a diary.

If you are part of a network, it may be that the virus information is held elsewhere – on a server, so that all workstations get the same information. You have individual responsibility for and interest in the data on your workstation's disk, so we advise you to familiarise yourself with information about when updating is performed.



# PC Plus Verdict

## ANALYSIS

### The winners

**I**t was a tough call: we chose for review ten renowned anti-virus products, all proven suppliers with excellent track records. And to be honest, we could recommend almost any of them, and pick a few holes in each about what we think could be done better.

It took years to convince people that seat belts in cars were a good thing: in the same way computer users seem unready to protect themselves with anti-virus software. This means that the simplest yet most effective software is likely to be most useful, especially to the single user; it doesn't take a long time to do its job, and makes no big demands on the operator. Yet if a virus ever attacks, it is dispatched immediately.

The two packages amongst the ten that we chose as best are consistent award winners, yet quite different from each other: they both caught all the viruses we exposed to them, and both feature easy installation, sensible operation, good documentation, total support and frequent updating.

*With so many excellent software packages available, which do we recommend?*

## BEST VALUE

### MCAFFEE VIRUSSCAN VERSION 5.00

■ PRICE £25 ■ EX VAT £20 ■ SUPPLIER Network Associates ■ PHONE 01296 318 700 ■ WEB [www.mcafee.co.uk](http://www.mcafee.co.uk)

**T**he McAfee VirusScan package is our choice this time around: its product is simple to install and run, non-obtrusive, inexpensive and effective. Long one of the most popular anti-virus packages and best known, the expertise behind it is great and its pedigree is impressive. Its newest version includes the award-winning straightforward interface with the brilliant and speedy scanning engine developed by Dr Solomon's, now a component company of the same parent. The brilliant way that updates are handled (selectively on the Internet) will encourage effective use of the protection it affords: there is no time penalty in going to the McAfee update site often – say once a day.

A brilliant little feature we liked was the automatic saving of Word and similar documents in a secure directory on disk, so that you have a means of restoring them if a macro virus strikes in the interim.



Some may not like the futuristic design of McAfee's latest central activity monitor but the features, the simplicity, the speed, the accuracy will win you over.

## LATEST VIRUS

### Love hurts

While this issue was in preparation, the LoveLetter (or Love Bug) virus struck widely around the world. It is a type called a 'worm', reproducing not by a programming trick, but by sending itself to just about all the addresses in your mail-reader's address book. E-mail itself cannot do this: the culprit is actually a 'script' (in Visual Basic for Applications, used normally for macros in Word, Excel and so on), sent as an attachment to e-mail.

This worm, like the similar Melissa in 1999, spreads so effectively that it infects the Web before anti-virus experts have even seen it, let alone worked out a counter-strategy. It is in cases like this that behaviour blockers may sound the warning, while classical scanners see nothing wrong – until they are updated.

There are some lessons to be learned here:

1. Be suspicious of executable attachments to e-mail, even if you know the sender – but especially if you don't know and trust the sender.
2. Keep informed about new viruses – not from rumours by friends or colleagues, but from the anti-virus specialists.
3. If you hear of a virus, consult the Web site of one of the experts: many of those listed in this article have late breaking news. It's also worth going to [www.hoaxkill.com](http://www.hoaxkill.com), which aims to identify and root out pointless rumours about viruses.

## BEST PERFORMANCE

### SOPHOS ANTI-VIRUS

■ PRICE £118 ■ EX VAT £110 ■ SUPPLIER Sophos ■ PHONE 01235 559933 ■ WWW [www.sophos.com](http://www.sophos.com)

**T**he Sophos team has been noted for its conservatism: their experts are not prone to introducing a look or technology just because it is 'flavour of the month'. Indeed for many years their technicians were actually lampooned for resisting the implementation of a 'monitor'-type scan, activated only when a program was requisitioned for execution. Sophos continued to say that the reduced efficiency of this type of scanning is not worth the risk: that standalone 'on-demand' scanning was the answer. With the advent of the Web on to the desktop, monitor scanning became a near necessity, and Sophos invented 'Intercheck' – a distinctive solution, in which each loaded program is passed through a VxD module and, in effect, scanned with the full 'on-demand' scanner. This solution is accurate, surprisingly fast and adaptable to desktops, workstations, servers, networks and even whole enterprises. When experts leapfrog into a technical lead with a virtually totally secure solution like that, you have to take them at their word: they are on the lookout for the best and most secure precautions for your data.



The support provided by the Sophos team is not exceeded by its competitors, and every bit of information, every operation of the anti-virus package is geared to the best interests of the responsible PC user.





PC Plus



This keyboard looks set to open up a whole realm of uses for Palm's hand-helds.

## PC Plus

## VERDICT

## PALM PORTABLE KEYBOARD

**For** Very portable, easy to set up and use, strong case

**Against** Can't use it on your lap – needs a flat surface

Range of features.....9

Ease of use.....10

Documentation.....9

Performance.....10

Value for money.....8

9/10

# PALM mobile PORTABLE KEYBOARD

*A portable keyboard that could revolutionise the way you work*

**Minimum requirements** Palm hand-held, access to PC for installation of the keyboard driver software **Tested on** Palm Vx

■ **PRICE** £70 ■ **EX VAT** £60 ■ **SUPPLIER** Palm ■ **PHONE** 0207 365 9820 ■ **WWW** www.palm.com

**T**his portable keyboard comes in two versions, one for each of the different docking mechanisms of the Palm III and Palm V series of hand-helds, but both have a unique feature – they fold away into a case about twice the size of a Palm hand-held itself. The case is rigid when it's closed so it should withstand plenty of knocks, and it comes with a soft zipped carrying case.

The way the keyboard folds has to be seen to be fully appreciated. It concertinas out in four sections when it's opened, the outer ones on the left and right sliding inwards to interlock with the inner ones. Two hinges, one on each of the end pieces, lock the whole keyboard firmly into place. The hand-held itself sits in a cradle at the top centre of the keyboard, and is supported at an angle of about 45° by a fold-out stand. The whole thing is set up in seconds and feels remarkably rigid.

To get the keyboard to work you need to install a 25K driver on to the Palm machine. Once this is on board and

the Palm is docked to the keyboard, you are ready to type – depressing any key turns the PDA on. The keys feel just like those on a portable computer when in use and this, combined with the fact that the keyboard is full sized, makes touch-typing extremely easy.

As well as providing a full alphanumeric coverage, there is a column of four keys down the right side of the keyboard which, in conjunction with a function key, provide access to the main Palm applications and to functions like the find tool, main applications menu and menus within applications. Various key combinations enable you to turn the backlight on and off, scroll around the screen, and even turn the hand-held itself off. You can customise settings for non PalmOS applications.

This keyboard could represent a revolution for Palm users. It is now no longer necessary to carry a portable computer around for making notes, writing letters, or working on low level business documents on the move.

**Sandra Vogel**

# CANON BJC-85 mobile

*Output photo-quality images from your portable*

**Minimum requirements** Win95/98, 486 processor, 16MB RAM, 30MB hard drive space, parallel, USB or infra-red port

**Specifications** 720x360dpi mono and colour printing, manufacturer quotes up to 5ppm draft mono and 2ppm draft colour Integrated 30 sheet feeder, weight 1.4Kg

**Additional information** Driver for Windows CE 2.1 also supplied

■ **PRICE** £257 ■ **EX VAT** £219 ■ **SUPPLIER** Canon ■ **PHONE** 0121 680 8062 ■ **WWW** www.canon.co.uk

**W**hile many portable computer users can save printing jobs until they are back at the office, it would still be great to print while on the move. Portable printers are the solution, and Canon has a pedigree in this department. The company's latest offering, the BJC-85, offers four-colour printing, accommodating a colour and black cartridge at the same time, with a large black cartridge taking up the entire bay if colour is not required.

Don't expect to generate similar quality images as those you'll get from a larger fixed location ink-jet or laser but for letters, invoices and quotations the 720x360dpi resolution should be fine. For this kind of document speed is good, too. The quoted speed of around five pages per minute in standard printing mode was close to the mark.

Colour output is fair in quality, though slower, and you can even get photo quality output – if you are prepared to wait for it. A sample colour image took just under three minutes to print at standard quality on ordinary paper. When we switched to super photo quality mode and used Canon's photo quality paper

**The BJC-85 is a portable printer that turns into a scanner, and can produce photo quality output.**

and ink, the image took closer to ten minutes to print. This is a long wait, but, to be fair, not one you are likely to have to endure often.

The printer connects to your portable via parallel or USB port or infra-red. The infra-red port cleverly swivels out from the back left side of the printer case swinging through almost 90° to help you to align it with your computer.

When it comes to portability, the BJC-85 is a bit of a brick weighing in at 1.4Kg without its external power supply. It is a shame that there is no built-in battery – hunting for mains power reduces mobility somewhat.

On the plus side around £59 (including VAT) will secure a colour scanner head, and it is nice that the printer driver is installed from the supplied CD without recourse to the control panel. This makes set up a simple, one-step operation.

**Sandra Vogel**



## PC Plus

## VERDICT

## CANON BJC-85

**For** Serviceable quality colour and mono printing, fair speed

**Against** Rather large to carry, no integral battery

Range of features.....8

Ease of use.....8

Documentation.....7

Performance.....7

Value for money.....7

7/10



# BOOKS

All books discussed were supplied by: **Computer Manuals, Birmingham.**

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**In this box set:**  
**Debugging the Development Process (Steve Maguire)**  
**Dynamics of Software Development (Jim McCarthy)**  
**Software Project Survival Guide (Steve McConnell)**

■ **PRICE** £41.39  
 ■ **FORMAT** Book  
 ■ **PUBLISHER** Microsoft Press  
 ■ **ISBN** 0-7356-0597-1  
 ■ **WWW** [www.microsoft.co.uk](http://www.microsoft.co.uk)

## SOFTWARE ENGINEERING CLASSICS (BOXED SET)

**A**ny programmer who does not get himself this boxed set of classic books is depriving himself of a wonderful read, and of the benefits of powerful insights by experienced software project leaders. The interesting fact about this particular trio of books is that they cover the subject of working within a software development project in three different ways, and in three different styles.

*Debugging the Development Process* is a book that should be read by every programmer, whether he is a 'lone ranger' or a member of a project team. It presents program development as if it were a program itself, and investigates how it can go wrong, how to test it, and, moreover, how to correct and improve it. Full of good humour as well as practical material, the book has many interesting stories of early days the author spent programming at Microsoft. You will walk away from this book armed with practical strategies for improving any programming effort of which you are part, even if you are not the team's leader.

*Software Project Survival Guide* addresses not so much coding techniques as the problems that accompany any and

every project: politics, friction in relationships, schedule difficulties, planning and testing. You can expect to find many new ideas and sound advice on how to make a project work. Though it is designed for the team leader, it is again useful for anybody involved in the development process – including non-programming managers.

*Dynamics of Software Development* sounds deceptively like the most technical book of the trio – but far from that, it is a delightful and insightful book of small epigrammatic essays, often funny. The book is, curiously, many things at the same time. It features many timely cartoon pictures rendered in a Leonardo da Vinci style: my favourite is 'Featuritis' that shows the results of unco-ordinated design. It is laid out in sections as if it is a chess manual: 'Opening Moves', 'The Middle Game'. It highlights 54 rules of thumb reminiscent of the Ferengi laws of acquisition: 'Rule 14: Take the oxygen along'.

**Wilf Hey**

**PC Plus 10/10**



■ **PRICE** £17.99  
 ■ **FORMAT** Book/CD  
 ■ **AUTHOR** Jill Freeze  
 ■ **PUBLISHER** SAMS  
 ■ **ISBN** 0-672-31328-6  
 ■ **WWW** [www.mcp.com/publishers/sams/](http://www.mcp.com/publishers/sams/)

## TEACH YOURSELF MICROSOFT INTERNET EXPLORER 5 IN 24 HOURS

**L**ike all the ...in 24 Hours books, this one does not make you an expert in a day; it is a full course, consisting of 24 separate hours. If you have already used Internet Explorer 5, you will probably be wondering how one could occupy 24 hours with education about it. Well, the answer is that this book covers quite a bit more, including some basics of Outlook Express, FrontPage Express and even of Word 97. The lessons are clear and well organised, and peppered with helpful screen shots. However, we felt that the graphics were rather flat and unimaginative. The content of the lessons varies from extremely simple to moderately demanding, and it is pleasant to find that they are well sorted so that it does not concentrate on heavy stuff later on. The main problem that some readers will have is that they came on board to learn Explorer 5 – primarily its implications compared to what has come before. But what they will find instead is that

the first significant new material comes in Hour Eight: up until then the basics of installation and Web-surfing consume the time. As an introduction to the Web, it is excellent, and has plenty of practical material. The beginner will find it valuable indeed, and would do well to keep it to hand during early months of using IE5 to access the Web.

The book outlines scores of useful tips – little that is stunningly original, but many that are certainly practical. The style is easy, confident and should raise the beginner to intermediate status if they conscientiously follow the material and do the exercises. If you have one of the more technical books about IE5, you will find them accessible, having been given the key by this neat little teach-yourself book.

**Wilf Hey**

**PC Plus 8/10**



■ **PRICE** £54.50  
 ■ **FORMAT** Hardbound book  
 ■ **PUBLISHER** QUE  
 ■ **AUTHOR** P Greenberg et al  
 ■ **ISBN** 0-7897-1281-4  
 ■ **WWW** [www.quecorp.com/](http://www.quecorp.com/)

## USING PEOPLESOFT SPECIAL EDITION

**T**his book is designed for decision-makers at firms that already use PeopleSoft – the revolutionary 'grass roots' ERP (Enterprise Resource Planning) package, and though not at all technical, it will be difficult reading for anybody with no knowledge of the PeopleSoft package itself.

What it amounts to is a reference manual giving practical advice on how best to deploy the services in this ERP. Some call ERPs a 'business in a box', but these authors demonstrate that this is a dangerously wrong approach. PeopleSoft is more like a genie in a bottle: you can get what you wish readily, cheaply and expertly – but you have to formulate the wish intelligently in the first place.

If nothing else, reading this book will give any non-managerial reader an insight into the basic workings of a full enterprise, and how effective it can be today to computerise all the main processes. As a reference book it is great, but we thought it could be a little more technical and specific in spots (especially in regard to financial components). Rather than a hardbound book, this would be better marketed in the form of a loose leaf binder so that technical material and your own practical experiences could be added.

**Wilf Hey**

**PC Plus 8/10**



Tony Browne reviews some of the smaller products that caught his eye this month

**PC Plus** 7/10

## Pocket Drive

Removable storage – that is, data that is not permanently linked to your computer – is getting smaller in physical size and yet the amount of storage held by these devices is increasing. The Pocket Drive, for example, comes in a variety of sizes and it's easily added to your system. Simply push one into the USB port of your choice and Windows will look for a driver. This is loaded in from a floppy and then you can use the Pocket Drive's Flash memory as a hot-swappable drive that will appear in the 'My Computer' window.

Within seconds you can transfer data over to your new drive. This can be taken away and then accessed by another computer as long as it already has the Pocket Drive's drivers loaded in.

In use, because there are no moving parts, data is transferred pretty quickly and reliably. If Windows gets built-in support for these devices, the floppy will surely be dead.



## Kodak PalmPix digital camera

Kodak has recently followed Casio's lead and produced a PDA camera. This one clips on to the popular Palm range of devices. It won't fit straight on to the Palm Vx or Palm V, but you can buy an adaptor that will fix this problem.

Turning your Palm into a camera isn't difficult: simply dock your Palm into its HotSync cradle, load in the driver software, install the program on and connect the small camera to the bottom of the Palm.

Taking snaps is easy because you can preview snaps via the Palm's LCD display. To take a picture, simply press the calendar button on the Palm. The maximum resolution of these pictures is 640x480 and there's a 2x digital zoom. This is an ideal add-on for the Palm-owning gadget freak. The image quality might not be much when compared to the latest digital cameras but it sure is fun!

**PC Plus** 8/10



## Palm Bumper



Do you use PDA? If you do, it could be worth getting a Palm Bumper to prevent

bumps and scratches. This rubber device has a tough, durable case that has two stylus holders incorporated on to the side.

There's a plastic flap on the front and an infra-red window so you can transfer data to other Palms when it's in the case.

Have we any complaints? The colour IIIc is a bit too big and the minuscule Palm V and Palm Vxs will only fit with the help of the supplied adaptor.

**PC Plus** 8/10

## Apollo P-2200 printer

Just over one year ago, Hewlett-Packard started producing a budget printer range. This range was named Apollo and this new model, the P-2200, looks reminiscent of the Epson Stylus 760, which was featured in the our roundup in issue 165. This is because both models subscribe to the iMac school of design.

The Apollo P-2200 also borrows heavily from Hewlett-Packard's vast vault of printer knowledge, as you would naturally expect. Both black and colour cartridges supplied are made by Hewlett-Packard and the model uses the paper-tray handles that hold printed output for a few seconds, enabling it to dry before touching other media.

Setting up the printer isn't the easiest task to do – the driver software loads in easily but the supplied documentation is poor. There is a small, poorly written manual and the rest of the instructions are on the CD.

The printing quality of this machine is similar to that of its HP badged cousins. Plain text was impressively dark but smudged; the printout was delivered in an average time. Colour reproduction took a while but results were satisfactory for a 300x300dpi printer. The Apollo isn't flimsy but it is disconcerting to see that the paper can be lifted out very easily. This is our only real complaint – but what can you say about a colour ink-jet printer that costs only £60?





**PC Plus** 9/10

## MICROSOFT INTELLIMOUSE OPTICAL

Last year Microsoft launched two new mice, the IntelliEye Explorer and the Intellimouse with IntelliEye. The Intellimouse with IntelliEye looks very much like an ordinary Intellimouse, but the larger IntelliEye Explorer looks cool in silver with lots of extra buttons which are supposed to aid productivity. These models are special because they both use a digital camera. The only thing that spoils this technical revolution is that neither is suitable for the left-hander.

Enter the new Intellimouse Optical. Instead of using the combination of micro-switches and a rubber ball that always needs cleaning, this mouse again uses digital camera technology. This mouse resembles a smaller IntelliEye Explorer: you get two side buttons and a thumbwheel but lose the silver colouring. Furthermore, unlike the IntelliEye Explorer, this mouse is shaped for use in either hand.

Turn the mouse upside down and you'll see the camera. It looks like a red glowing eye and it takes 1,500 pictures of your desktop a second. These pictures are then used to work out where you've moved your mouse. It's a clever system and works well. We found it comfortable and excellent in use.



**PC Plus** 8/10

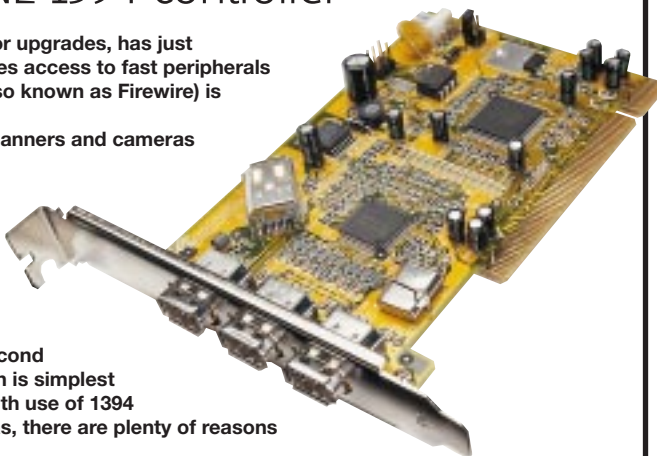
## Evergreen FireLINE 1394 controller

Evergreen, best known for its processor upgrades, has just introduced a 1394 controller, which gives access to fast peripherals from virtually any PC. The 1394 bus (also known as Firewire) is like a fast USB connection.

While you can connect compatible scanners and cameras to it as you can with USB, you can also use link up fast peripherals, like hard drives. One device can be daisy-chained to the back of another like SCSI and slow peripherals won't hold back fast ones.

Evergreen's FireLINE card provides three external sockets and one on the inside. Drivers for Win98 and Win98 Second Edition are included, though installation is simplest under SE. The price is a bit high, but with use of 1394 spreading to devices like video cameras, there are plenty of reasons for adding the bus to your desktop.

Simon Williams



**PC Plus** 8/10

### PRODUCT FACTS

#### Apollo P-2200 Printer

■ PRICE £60

■ EX VAT £51

■ SUPPLIER Apollo

■ PHONE 0870 6071 394

■ WWW [www.myapollo.com](http://www.myapollo.com)

**Minimum requirements** Win 95/98/NT 486 or higher, 16MB RAM, 20MB hard drive  
**Tested on** HP Vectra VE, 64MB RAM, 4GB hard drive, Win98 SE

#### Evergreen FireLINE 1394 controller

■ PRICE £115

■ EX VAT £99

■ SUPPLIER Evergreen Technologies

■ PHONE 01793 601 300

■ WWW [www.evergreennow.co.uk](http://www.evergreennow.co.uk)

**Minimum requirements** Win98 or 98SE-based PC with spare PCI expansion slot  
**Tested on** Carrera Lynx M533, 533MHz Celeron, 64MB memory, 12.6GB hard drive

#### Kodak PalmPix Digital Camera

■ PRICE £150

■ EX VAT £128

■ SUPPLIER Kodak

■ PHONE 0870 243 0270

■ WWW [www.kodak.co.uk](http://www.kodak.co.uk)

**Minimum requirements** Win95/98/NT 486 or higher, 16MB RAM, 20MB hard drive  
**Tested on** HP Vectra VE, 64MB RAM, 4GB hard drive, Win98 SE

**Extra information** Needs special adaptor for Palm V and Vx. Doesn't fit Handspring Visor models

#### Microsoft Intellimouse Optical

■ PRICE £40

■ EX VAT £34

■ SUPPLIER Microsoft

■ PHONE 0870 601 0100

■ WWW [www.microsoft.com](http://www.microsoft.com)

**Minimum requirements** Any Windows-based PC  
**Tested on** IBM Activa, PII 400, 128MB RAM, 10GB hard drive  
**Extra information** Comes with PS2 and USB adaptors

#### Palm Bumper

■ PRICE £30

■ EX VAT £26

■ SUPPLIER Widget software

■ PHONE 01438 818 818

■ WWW [www.widget.co.uk](http://www.widget.co.uk)

**Tested on** Palm Vx

**Extra information** Will not fit the Palm IIIc or Handspring Visor

#### Pocket Drive

■ PRICE £100

■ EX VAT £85

■ SUPPLIER DS Computers

■ PHONE 020 8447 0123

**Minimum requirements** Win95/98 with USB support  
**Tested on** HP Vectra VE, 64MB RAM, 4GB hard drive, Win98 SE  
**Extra information** 16MB, 64MB, 128MB and 256MB versions coming soon



CD-RWs are getting fast – maybe too fast. With 12-speed writers available, **Paul Warner** looks at what's available and whether the media is up to it

# Go for the burn

## Group test: CD-RW drives

**F**ancy creating your own musical masterpiece on CD or perhaps producing a specialist knowledge base? Maybe you'd like to back up vast amounts of data to disc or store your digital pictures on CD. Well it is a lot cheaper and easier than you might think.

Within a year, the black art of creating CDs has moved on a fair way. When we last put a few drives through the lab tests, the fastest we could find was a four speed drive and copying a CD took just under an hour. The first time we tried to 'burn' a CD, as it's commonly known, we produced six dud discs before getting any success.

When any technology moves from a specialist base to general consumer use, there is always a period of consolidation. Many of the general rules of producing a CD-R or CD-RW still hold true but the whole process is now a lot more stable. We've included a list of things to remember when writing or copying a CD-RW.

### Common problems

The commonest problem when writing a CD is buffer under-run. When you write a track or a whole disc using DAO (Disc At Once), it's important that the data being written is supplied in an uninterrupted stream to the laser. Drop one bit and the whole disc is useless. You could be reading from another CD or a collection of files

on your hard drive and every time your data source changes, you'd have a blip in the data flow. To overcome this all drives have a data buffer. This sits between your data source on the computer and the recorder. Before any data is written, the buffer fills up and acts as a data reservoir, smoothing and regulating the flow. Earlier drives may only have had 128 or 256KB of buffer and the smallest interruption would crash the write. Forget to turn off your screen saver and the write would fail when it cut in.

### SCSI or IDE

The best solution was to use SCSI (small computer system interface) recorders and hard drives. Transfer between devices on a SCSI bus is less susceptible to interruption but the downside is that SCSI equipment is more expensive than the predominant IDE (Integrated





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Development Environment) devices. This is true with the latest equipment and if you were planning a professional set up, it would be advisable to stick with SCSI. However, most modern machines use Bus Mastering and UDMA66. This enables IDE devices to communicate directly with each other without putting too high a load on the CPU. Manufacturers have increased buffer sizes and these are now up to 4MB, some are even fitting 8MB. The increased performance of the bus and improved buffer size now means that IDE CD-R and CD-RW drives are far more reliable. Most of the units in this month's group test are suitable for use on modern IDE machines and can be used as a direct exchange for an existing CD player.

If you've already fitted a DVD player and have a spare drive bay, why not fit a CD-R or CD-RW drive alongside it. You retain the DVD

capacity and provided the CD playback speed is fast enough, you'll have the facility to do an 'on-the-fly' recording. On-the-fly recording is moving data directly from the player to the recorder – the quickest way to copy a CD. There is a new generation of drives that not only write to CD-R and CD-RW but can also play DVDs. We've already reviewed drives from Toshiba and Memorex in our DVD round-up in July's issue (165). These are a bit more expensive but make an ideal alternative if you're pushed for space.

To review the drives we've used a range of tests. CD-Tach is our standard software for checking CD performance. We used this and several data transfer tests to check read performance. Details of these are included in our results table on page 78. Though the majority of drives use the IDE interface, we also included SCSI and USB drives to get an overall view of the relative performance.





**PC Plus**

**IDE**



*The Acer comes with Nero and is a reasonable price for an eight-speed*

■ PRICE	£200	■ EX VAT	£170	<b>Tested on</b> K6-200 with UDMA 33. Adaptec SCSI controller and USB ports <b>Extra Information</b> Comes with Nero Burning ROM Software
■ SUPPLIER	Misco			
■ PHONE	01933 400000			
■ WWW	acerperipherals.nl			

**A**t first look, the 8432A drive from Acer looks much the same as the majority of IDE drives. It has a standard interface for connecting to your motherboard and outputs for analog and digital audio. The bit that sets this drive apart is tucked away inside the box. Unlike the other drives in this review, Acer has chosen to use an 8MB buffer. This resulted in some of the best results of the bunch.

Installation is straightforward; you need to set a jumper at the rear of the drive to select master/slave installation. If you're using it as a second device on an IDE bus, you need to select slave otherwise it's a master. Also check your hard drive, some require a jumper change if a slave is connected.

Acer hasn't gone over the top with documentation and supplies a simple broadsheet with installation details and a few diagrams. If you've fitted drives before then this won't bother you but a first-time user may feel challenged. Physically, the drive is well built and as well as the obligatory headphone socket and volume control has an extra button on the fascia to play and skip tracks on a music CD.

Acer has also included Nero software for writing CDs and InCD for packet writing with a CD-RW. This is a great bit of software and one of our favourites. The extra size buffer makes this drive less susceptible to buffer under-run. A quick drive with powerful software.

**IDE**



*Overburning, CD Text and Nero make a great combination*

■ PRICE	£229	■ EX VAT	£195	<b>Tested on</b> K6-200 with UDMA 33. Adaptec SCSI controller and USB ports <b>Extra Information</b> Creative sells directly from its Web site
■ SUPPLIER	Creative			
■ WWW	europe.creative.com			

**I**t's usual to get a few extra goodies when you buy a piece of kit from Creative, and the 8X/4X is no exception. Included with its latest 8x4x32 speed drive is the Labelle CD labelling kit, a sample CD-RW blank and 10 CD-R discs.

This is another fast drive and it turned in some impressive results. Writing times to CD-R were the same as the Acer drive and very close with CD-RW media. However, disc copy was one of the fastest in the whole group. When we tested CD copying we used the hard drive to create an intermediate image. This takes longer than on-the-fly directly from drive to drive, but is less likely to fall over. If you've only got one drive, this is how you have to do it.

The drive supports Disc At Once (DAO) recording and is capable of both CD Text and over burning. CD Text will enable you to include track descriptions and information between audio tracks on a CD, which can be viewed on LCD display panels on car or audio CD players. Over burning will be of great interest to those of you who attempt to copy the uncopyable. Coupled with the Nero software it enables you to squeeze extra data on your CD. These extra few MB of data are often used as a means of copy protection and prevent you from making a back up. However, the combination of Nero and a CD writer that supports over burning should manage most discs. A fast drive that works well with Nero – great for hacking around with your CDs.



*As USB drives go, this is one of the best*

■ PRICE	£300	■ EX VAT	£255	<b>Tested on</b> K6-200 with UDMA 33. Adaptec SCSI controller and USB ports <b>Extra Information</b> Order cable separately (approx £30)
■ SUPPLIER	Impleo direct on-line			
■ PHONE	0118 977 9700			
■ WWW	impleo.com			

**W**e managed to get hold of the USB version of the Datawise drive. It certainly wouldn't win any awards for speed but this is not the market it's aimed at. The drive is compact with a separate mains unit and designed specifically for those of you who have to burn on the move. The on-board battery is good for about two and a half hours of use (and recharges in a couple). The drive has a universal connector at the rear of the unit that looks like a small SCSI socket. Different adaptors can be plugged in; we tested using the universal USB connector but Datawise also sells parallel or PCMCIA adaptors if your portable doesn't have a USB socket.

The documentation claims that the drive works at four-speed for both CD-R and CD-RW, however we had to write at two speed to successfully copy a CD. The drive supports DAO and over burn but not CD Text. Datawise supplies a small data sheet to get you up and running but the main documentation comes in PDF format on the distribution CD along with the USB drivers. This is easy to follow and perfectly adequate, provided you've got another machine with a CD so that you can read the manual before installing the drive. Adaptec's Easy CD Creator and Direct CD software give you all the tools you need to write CDs and set up a UDF file system for packet writing. Not a fast drive, but if you need to write CDs on the move then this is the one.

**PC Plus**

**VERDICT**

**ACER CRW 8432A**

*For* Good performer with great software

*Against* Minimal documentation

Range of features.....	8
Ease of use.....	7
Documentation.....	5
Performance.....	9
Value for money.....	7

**7/10**

**PC Plus**

**VERDICT**

**CREATIVE 8X/4X**

*For* Fast drive that works well with Nero

*Against* More expensive than some

Range of features.....	9
Ease of use.....	9
Documentation.....	10
Performance.....	9
Value for money.....	8

**9/10**

**PC Plus**

**VERDICT**

**DATAWISE CD-RW DRIVE**

*For* Ideal for mobile use

*Against* Not the fastest and documentation on CD

Range of features.....	8
Ease of use.....	7
Documentation.....	5
Performance.....	5
Value for money.....	6

**6/10**



## PC Plus

## IDE

## HEWLETT-PACKARD



## CD WRITER PLUS 9310

*Great for fast CD-R but you have to pay for it*

■ PRICE £199 ■ EX VAT £169

■ SUPPLIER Hewlett-Packard

■ PHONE 0990 474747

■ WWW hp.com/uk

Tested on K6-200 with UDMA 33. Adaptec SCSI controller and USB ports

**H**ewlett-Packard's latest offering ups the CD-R writing speed to 10x and achieved the fastest write to CD-R of all the drives in our group test. However, the disc copy and CD read performance was mediocre by comparison, with many of the eight-speed drives outperforming it. As we've come to expect from HP's equipment, the overall built quality is high and in operation the mechanism is quiet and has a solid feel.

HP has included a few extras: a CD labelling kit and software from Neato with a few sample label sheets to start you off. The CD writing and UDF (Universal Disk Format) filing system software is supplied on an HP installation disc but is Adaptec's Easy CD Creator and Direct CD. Documentation and an instructional video are also supplied on the same CD. If you're into sampling and creating music loops, then you're in for a treat. HP has included a copy of Sonic Foundry's Acid Loop software and Cubasis. This enables you to create music by adding your own sampled loops and stretching them to fit your base tempo. You can then use Cubasis to assemble your final production prior to burning.

Documentation is good and a quick start sheet takes you graphically through the installation. The drive supports CD Text but not over burning, so you can include text with your music CDs but you won't squeeze those extra few MB out of your disc. A quick drive, well built, and ideal for anyone with an interest in music.

## IOMEGA



## USB CD-RW

*Nice to look at but it doesn't live up to expectation*

■ PRICE £229 ■ EX VAT £195

■ SUPPLIER Iomega

■ PHONE 020 736 595 27

■ WWW iomega-europe.com

Tested on K6-200 with UDMA 33. Adaptec SCSI controller and USB ports

**O**utwardly this drive from Iomega looks the part. A stylish design that wouldn't disgrace any desktop, simple USB connectivity and it comes from a company with a history of storage products. With USB, it will plug into any machine with a spare USB port and will even work with a Mac – even the colour almost matches the Mac blue.

We haven't come to expect high performance from external USB CD-R and CD-RW drives and the Iomega is no exception. CD read performance was a lot slower than the LaCie USB drive and returned a CD-Tach rating of 3.8x. Other results were equally disappointing, producing some of the slowest results for writing to CD-R and CD-RW with only the Datavise taking longer to copy a CD.

The typical user looking to buy this drive may not be concerned with speed, as it would make an ideal external drive for the mobile user. It's hot swappable with the USB port and comes with disc labelling software and the Adaptec Easy CD Creator. It's in this area that everything falls apart. Dig down in the documentation and you'll find a cautionary note.

The gist of this is that the drive doesn't work reliably with CD-RW data using the UDF filing system. The Direct CD software, that works with all the other drives we've tested, falls over. It's a bit like selling a car without reverse gear. The whole object of CD-RW is to use it as a rewritable storage device and the UDF filing system is the ideal way – Iomega advise you not to use the supplied software!

## SCSI

## LACIE EXTERNAL



## SCSI CD-RW

*The fastest CD reads and copies, but you have to pay for it*

■ PRICE £375 ■ EX VAT £319

■ SUPPLIER LaCie

■ PHONE 020 78 72 8000

■ WWW lacie.com

Tested on K6-200 with UDMA 33. Adaptec SCSI controller and USB ports

**W**e mentioned earlier in this feature that if you're looking for a professional solution to CD-R or CD-RW then SCSI still offers the better but more expensive option. A quick look at the results for LaCie's latest external SCSI drive says it all. CD read performance is way out in front of all the others and it turned in the best CD copy results. However, this doesn't come cheap. This external unit from LaCie claims a 12x4x32 performance. We couldn't find media to test the drive successfully at a 12x write, so we'll have to take LaCie's word for it, but at 10-speed it still produced some of the fastest results.

Software for the PC comes from Adaptec with additional Toast software for the Mac. As the drive is external, in its rather smart blue case, you could attach it to either a Mac or PC. If you work in a mixed environment, a drive like this can be used on both platforms and moved around the office when anyone needs to burn a CD.

If you are already running SCSI on your system, all you need to do is to set it up at a spare address and adjust your termination to the last device. If you don't have SCSI, then you need to invest in a card. If you plan to fit a SCSI hard drive, then invest in a decent card (for about £100) though you can use one that's suitable for slower devices (about £40). The LaCie External SCSI is pricey, but would be good if it's your only CD drive. It really comes into its own copying CDs.

## PC Plus

## VERDICT

## HEWLETT-PACKARD CD WRITER PLUS

For A fast drive and it's built by HP

Against A bit expensive but great software

Range of features.....9

Ease of use.....8

Documentation.....9

Performance.....9

Value for money.....8

8/10

## PC Plus

## VERDICT

## IOMEGA USB CD-RW

For Nice design

Against Unreliable when using UDF

Range of features.....7

Ease of use.....7

Documentation.....5

Performance.....3

Value for money.....0

4/10

## PC Plus

## VERDICT

## LACIE EXTERNAL SCSI CD-RW

For Great performance

Against Price

Range of features.....9

Ease of use.....9

Documentation.....9

Performance.....9

Value for money.....7

9/10





**PC Plus**

**IDE**



*It may look like its SCSI stablemate but doesn't have the same oomph*

■ **PRICE** £253 ■ **EX VAT** £215  
 ■ **SUPPLIER** LaCie  
 ■ **PHONE** 020 78 72 8000  
 ■ **WWW** lacie.com

**Tested on** K6-200 with UDMA 33. Adaptec SCSI controller and USB ports  
**Extra Information** Audio cable supplied

**D**on't get too excited about this second drive from LaCie. It's as different as chalk and cheese compared to its SCSI stablemate. Admittedly it looks the same, but that's where the similarity ends. To give LaCie its due, it only claims a 4x4 CD-R/CD-RW performance but on test we found it hard to achieve even this level of speed. CD-Tach turned in a slow rating of 3.9x and both the tests at 4x failed and we had to try again at 2x to get a result.

The main thing that this drive has got going for it is an USB interface. We did have similar problems getting quoted performance from the Datawise USB drive. Software is obviously a speed issue with USB at present. However, USB does give you simple connectivity and perhaps when the next generation appears it will give us speed as well as convenience.

LaCie supplies the same suite of Adaptec software with this drive as with the faster SCSI drive. This is supplied on two CDs, one for the Mac with Toast and the other for the PC with Adaptec Easy CD creator and Direct CD. Installation is simple: just hot plug the drive into a USB port. The new device will be detected and Windows asks you for a driver from the supplied floppy. A separate application called Silverlining98 will also install, enabling you to control features on the USB connection. It may look similar to LaCie's SCSI brother, but it's just not in the same performance league.



*A fully-featured drive with a steady performance*

■ **PRICE** £230 ■ **EX VAT** £196  
 ■ **SUPPLIER** LG UK  
 ■ **PHONE** 0870 607 5544  
 ■ **WWW** lge.co.uk

**Tested on** K6-200 with UDMA 33. Adaptec SCSI controller and USB ports

**W**ith a 8x4x32 specification, the latest CD-RW from LG falls right in the middle of the range. But in our tests it held its own against drives with faster advertised write speeds, neck-and-neck with the 8x Acer, faster than the 12x LaCie and only a few seconds slower than the 10x HP. It also turned excellent results for reading from CD. The recommended price of £230 may seem a bit on the steep side but LG assures us that the street price should be substantially lower.

This drive is suited to the adventurous. If you plan to try out some of the sophisticated features like CD Text, over burning or disc copy, the 8080B handles them. Standard software is supplied by Adaptec for burning and UDF support, and there's an upgrade option to the full version with features like noise removal from old recordings before burning them to CD-R and creation of picture collections on CD.

To test all these drives we used the latest version 5.00 of Nero Burning Rom (reviewed on page 121). It's compatible with every drive tested and gave us a level playing field for performance comparison. Mechanically, the drive has a solid feel and a smooth motorised tray. It comes with a 2MB buffer and, alongside the standard eject button, the fascia includes an audio play button.

This drive performed faultlessly. While one drive just beats it in the CD-R performance stakes, the extra features such as over burn make it worthy of our Performance Award.



*One of the better 8x4x32 drives and it supports over burning*

■ **PRICE** £175 ■ **EX VAT** £149  
 ■ **SUPPLIER** 0845 6003535  
 ■ **PHONE** Panasonic  
 ■ **WWW** panasonic.com

**Tested on** K6-200 with UDMA 33. Adaptec SCSI controller and USB ports

**P**anasonic has been developing CD and DVD hardware for some years and was the first company to produce the PD Drive – a forerunner of today's DVD-RAM drives. As with most of its drives, the mechanism is labelled as manufactured by Matsushita. This isn't a supplier that Panasonic buy from but the original company in Japan. When they decided to enter the European market place they chose to trade under the name Panasonic.

The CW 7585-B is another of the 8x4x32 format drives and turned in impressive results. The CD copy speeds are among the fastest, only marginally slower than the SCSI drive from LaCie. CD-Tach produced a reasonable rating of 14.5x and the times for writing to CD-R and CD-RW are consistently high.

CD-Text, DAO and over burning are supported, so you won't be restricted from copying oversize discs or producing music CDs with text information. Installation is simple with the hardware recognised and installed automatically. Adaptec's Easy CD creator and CD-Direct software comes with a support disc, most CD-R and CD-RW software needs information about the particular drive that's used and this patches the software to support the 7585-B.

The Panasonic drive has all the credentials, it turned in some fast results and performed faultlessly. The recommended retail price is more realistic than some of the other drives, but if the price was more competitive it would have been in with a chance for our Value for Money Award.

**PC Plus**

**VERDICT**

**LACIE USB CD-RW**

*For USB connection and well constructed Against Poor performance*

Range of features.....8  
 Ease of use.....9  
 Documentation.....9  
 Performance.....5  
 Value for money.....6

**7/10**

**PC Plus**

**VERDICT**

**LG CED 8080B**

*For Fully-featured, well-made drive Against Pricey*

Range of features.....9  
 Ease of use.....9  
 Documentation.....9  
 Performance.....10  
 Value for money.....9

**9/10**

**PC Plus**

**VERDICT**

**PANASONIC CW 7585-B**

*For Good performance and a reasonable price Against Nothing*

Range of features.....9  
 Ease of use.....8  
 Documentation.....7  
 Performance.....9  
 Value for money.....9

**9/10**



**PC Plus**

**IDE**

**PHILIPS**



**CDRW 800**

*A good software package including a version of Easy CD*

■ PRICE £159 ■ EX VAT £135

■ SUPPLIER Philips

■ PHONE 0208 689 4444

■ WWW pcstuff.philips.com

Tested on K6-200 with UDMA 33. Adaptec SCSI controller and USB ports

**T**he last time we looked at a CD-R drive from Philips, it received its own special 'Del Boy' award for all the extra gold bits. The 800 is slightly more restrained but does feature a gold loading tray flap and control button. Don't let this detract you from the drive; it is yet another 8x4x32 drive that connects to a standard IDE interface and it turned in reasonable performance. It rated at 14.2x under CD-Tach and was within 10 per cent of the best performers in writing a CD-R or CD-RW. The only area that let it down was the CD copy time that took almost half as long again as the fastest drives. This was caused by a failure to copy at 8x and having to reduce the write speed to 6x.

Philips has included the latest version of the Adaptec Easy CD creator software. This is the cut-down version supplied with many of the drives in our test. It will enable you to burn CD-R and supports packet writing to CD-RW with the Direct CD UDF software. You get a jewel case and CD label designer with this version but if you fancy creating video CDs or creating a music CD from vinyl, then you may need to upgrade to the Deluxe version. Needless to say, Adaptec gives you every opportunity to do this directly from its software.

This is a capable drive with good software. It doesn't support over burn or CD Text but is fine for general use.

**IDE**

**SAMSUNG**



**SW208**

*A competent drive but no CD Text or over burn*

■ PRICE £163 ■ EX VAT £139

■ SUPPLIER Samsung

■ PHONE 0800 521652

■ WWW samsungelectronics.com

Tested on K6-200 with UDMA 33. Adaptec SCSI controller and USB ports

**O**f all the drives in our review, the SW208 drive from Samsung returned the fastest random access speeds for reading a CD and produced a CD-Tach index of 14.8x. It also held up well in the other tests and was toward the top end of all the results among the 8x4x32 drives. By using a 4MB buffer, Samsung has improved the write reliability, especially with on-the-fly recording and we didn't experience any write errors during our tests.

The drive does support DAO recording but doesn't over burn or produce CD Text discs. This is a shame as with these extra features and at a realistic price, it would have been an exceptional buy. Samsung supplies a compact but informative manual covering the basic installation. Software comes, again, from Adaptec, not the latest release 4.0 of Easy CD Creator but the earlier version 3.5. This is perfectly functional and you can upgrade to the latest version if you find you can't live without it.

We installed the drive as a slave device on the IDE bus. It was immediately recognised by Windows 98 and didn't require any additional drivers. However, Samsung provides DOS drivers for operation outside of Windows. The on-board BIOS is flashable (you can update it with a new BIOS image). Flash write routines and the latest BIOS data are available from the Samsung Web site.

**IDE**

**SONY**



**CRX145E-RP**

*A fast drive and the best software package of the bunch*

■ PRICE £199 ■ EX VAT £169

■ SUPPLIER Sony

■ PHONE 01932 816660

■ WWW sony-cp.com/cd-rw

Tested on K6-200 with UDMA 33. Adaptec SCSI controller and USB ports

**S**ony has an enviable reputation in the manufacture of CD equipment and associated optical equipment. This 10x4x32 drive will do nothing to damage that reputation. It performed flawlessly and produced the fastest disc copy times along with some of the quickest times for our other tests.

This isn't the end of the story, though. Along with a fast drive, Sony has bundled a respectable selection of software that should keep everyone satisfied. The WinOnCD and PacketCD software handle the general CD writing and establish the UDF filing system on your machine. PowerQuest Drive Image and DataKeeper are supplied for backing up either your whole drive or specific data. Photobase is a complete multimedia management system enabling you to create albums of images, videos or sounds for presentation. Instant Play is a CD player which gives you the ability to store soundtracks as digital images on your hard drive with any CD Text information about each track. Alongside this, Sony supplies Wave Lab, a digital audio editor which is one of the fastest we've come across and includes real-time editing during playback. Finally, Arcsoft's Video Impression is a fully-featured video editing program which enables you to create video presentations on CD.

This is quite a package, the only shortcoming was the inability to over burn, but you can't have everything. It's not the cheapest but you're getting a great software package and Sony's technology.

**PC Plus**

**VERDICT**

**PHILIPS CDRW 800**

For Reliable software and reasonable documentation  
Against Slow on direct CD copy

Range of features.....8  
Ease of use.....8  
Documentation.....8  
Performance.....8  
Value for money.....8

**8/10**

**PC Plus**

**VERDICT**

**SAMSUNG SW208**

For Reliable and competent drive  
Against No CD Text or over burn

Range of features.....8  
Ease of use.....8  
Documentation.....8  
Performance.....8  
Value for money.....9

**8/10**

**PC Plus**

**VERDICT**

**SONY CRX145E-RP**

For A great drive and a great software bundle  
Against Not much but we'd like to over burn

Range of features.....9  
Ease of use.....9  
Documentation.....9  
Performance.....9  
Value for money.....8

**9/10**



## PC Plus

IDE



Not the highest specification drive, but the best value

■ PRICE £149 ■ EX VAT £127

■ SUPPLIER Micro Warehouse

■ PHONE 0208 9069111

■ WWW teac.de

Tested on K6-200 with UDMA 33. Adaptec SCSI controller and USB ports

**T**his drive from Teac comes at a reasonable £149 inclusive of VAT. It may not be the fastest on the block, it's only rated at 4x4x32, but does have full support for DAO, CD Text and over burning. This makes it an ideal choice if you're interested in a bit of 'specialist' CD burning. A slower drive does have one bonus; you can usually use most media and don't have to spend more for ultra fast CD blanks. As for CD-RW, four-speed is as fast as it gets at the moment so you lose nothing. This is supported by our test results that show the W54EK the equal of most of the other drives in CD-RW mode but noticeably slower on a CD copy using CD-R media.

Teac supplies version 4 of the Nero Burning Rom software, which also includes InCD for packet writing enabling you to write and erase files from a CD-RW disc as if it was a hard drive. An upgrade to version 4.02 is available from the Nero site ([www.ahead.de](http://www.ahead.de)). If you want to try before you buy, a shareware version of Nero is available for download.

Installation is simple. Check the jumpers to set the drive as slave if you're using another drive on the IDE bus, fit the power and sound cables and you're away. This is a great value package using one of our favourite CD software packages – if you don't mind not having the fastest machine around, then this drive is well worth considering.

## PC Plus

## VERDICT

## TEAC CD W54EK

For A great bundle at a realistic price  
Against Not the fastest

Range of features.....9  
Ease of use.....8  
Documentation.....7  
Performance.....8  
Value for money.....10

8/10

## GLOSSARY

## Burning jargon

CD cutters have built their own language. Here's your phrase-book

**D**on't know your under runs from your over burns? Don't worry – a few concepts will go a long way.

## Buffer

Built-in memory on the CD cutter. The more there is, the less likely a 'buffer under run'.

## CD-R

Sometimes known as CD-ROM, refers to write-once media: data cannot be erased and rewritten. Can contain data, audio or both. These CDs will be readable in any PC CD drive.

## CD-RW

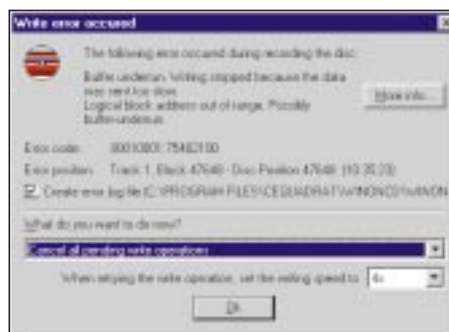
Rewritable CDs. Much like a hard-drive, these CDs can be written, erased and written again. Requires special, more expensive disks and won't be readable by some standard CD drives.

## DAO

'Disk At Once'. A writing technique that outputs all the data to a CD-R in one go, closing the disk once finished so no further data can be added. Recommended for creating masters that will be sent for duplication.

## El Torrito

Extensions to the ISO9660 specification that enable booting directly from CD-ROM.



Just wrecked a CD? We don't advise microwaving them, but the sparks are very pretty...

## ISO9660

The original CD specification. Only supports short file names, so has been extended with systems such as Joliet.

## Joliet

Microsoft's extensions to the ISO9660 file system that enable long file names.

## Over burn

Writing beyond the usual 74 minute/650MB limit of a CD. Not all standard drives will be able to read the resulting disk. Some media is specially built for over burning.

## Rock Ridge

Unix/Linux extensions to ISO9660 that enable long file names and file permissions on CD-ROM.

## Track

On audio CDs, a single song or piece of music is recorded as a track. Data CDs are normally seen as a single track.

## UDF

'Universal disk format'. The format used for CD-RWs and DVDs. Often mixed with ISO9660 to create a UDF/ISO9660 hybrid, containing both data and video.

## Under run

When the CD writer's buffer is emptying faster than the operating system can fill it, it will run out of data to write to the CD. An under run occurs. The laser stops writing and the CD becomes yet another shiny coaster.

## TOP TIPS

## Watch out there's an interrupt about

How to burn your CDs with confidence

**N**o matter how prepared you are, there will always be something that messes up your first couple of burns. We've gathered together a few hard-earned tips that could save you from an ever increasing pile of dead CD blank discs.

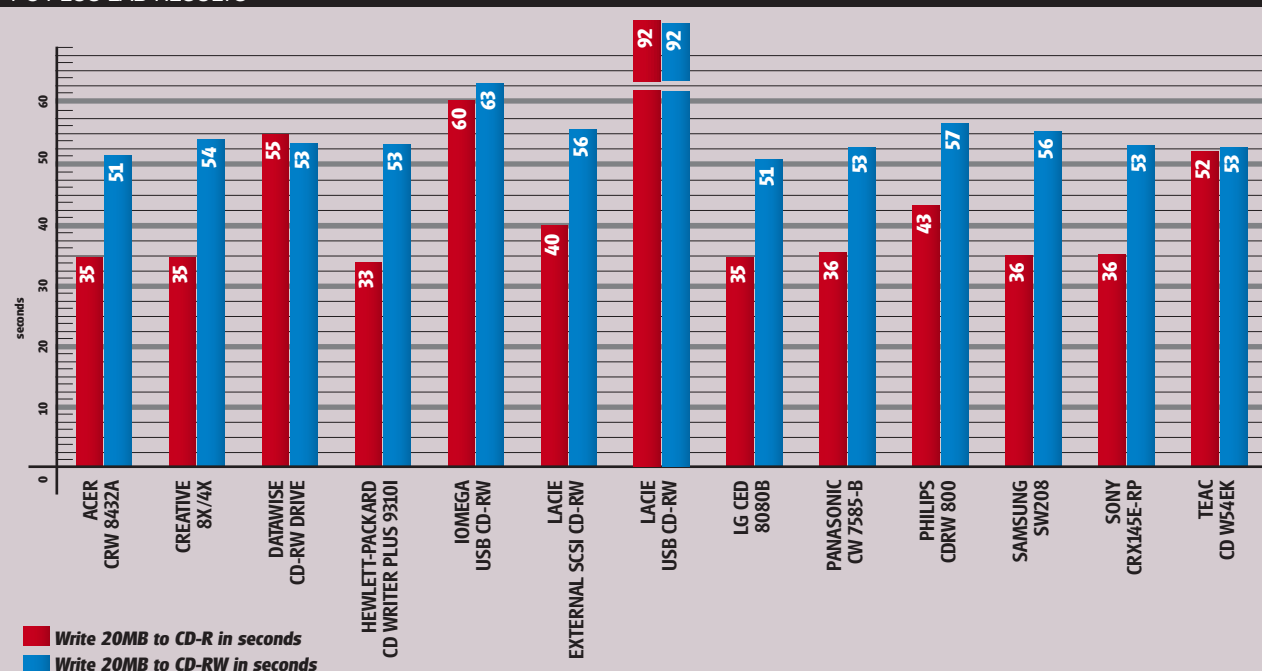
1. Turn off your screen saver. If it cuts in halfway through a burn, you lose data.
2. The same goes for power management. If you must use it, set it up to cut in after an hour.
3. We turn off auto detect on the CD drives. You don't want CDs to auto start every time you stick one in a drive.
4. Defrag your hard drive and make certain that any temp files are set to drives with enough space.
5. Some programs like Microsoft Office monitor drives to keep a catalogue of available files. Turn this off as it scans your drives.
6. If you're connected to a network, log off. You don't want anyone using a shared device like a printer when you're in the middle of a burn.
7. Why not set up multi users on your computer. You could have an alter ego for CD work that has all these features switched off. When you need to work with CD-RW just log in as CD Sid and burn with confidence.



PC PLUS PRODUCT FACTS

Name	Speed	Disc at Once	Overburn	Overburn Protection	CD-Text	Interface	Buffer size MB	Software Supplied	Price inc VAT	Verdict
Acer CRW 8432A	8x4x32	✓	X	X	X	IDE	2	Nero	£200	7
Creative 8X/4X	8x4x32	✓	✓	X	✓	IDE	2	Nero & AbCD Packet writing	£229	9
Datawise CD-RW Drive	4x4x32	✓	✓	X	X	USB/PCMCIA	2	Adaptec	£300	6
HP CD Writer Plus 9310	10x4x32	✓	X	X	✓	IDE	4	Adaptec	£199	8
Iomega USB CD-RW	4x4x32	✓	X	X	X	USB	2	Adaptec	£229	4
LaCie External SCSI CD-RW	12x4x32	✓	X	X	✓	SCSI	4	Adaptec	£375	9
LaCie USB CD-RW	4x4x32	✓	✓	X	X	USB	2	Adaptec	£253	7
LG CED 8080B	8x4x32	✓	✓	X	✓	IDE	2	Adaptec	£230	9 
Panasonic CW 7585-B	8x4x32	✓	✓	X	✓	IDE	2	Adaptec	£175	9
Philips CDRW 800	8x4x32	✓	X	X	X	IDE	2	Adaptec	£159	8
Samsung SW208	8x4x32	✓	X	X	X	IDE	4	Adaptec	£163	8
Sony CRX145E-RP	10x4x32	✓	X	X	✓	IDE	4	Sony CD Tools	£199	9
Teac CD W54EK	4x4x32	✓	✓	X	✓	IDE	2	Nero 4 In CD for Packet Writing	£149	8 

PC PLUS LAB RESULTS







# PC Plus Verdict

You may think that all 8x4x32 drives are equal in performance but our tests reveal that some are more equal than others

## ANALYSIS

### Getting faster all the time

*Drive speeds have increased over the past year*

**A** look at our results chart will give you an idea of how things are changing. Last year a four-speed drive was considered fast, now we're seeing drives quoted at twelve-speed for writing to CD-R while writing to CD-RW has generally increased from two to four-speed. This doesn't mean you can grab any old blank and write to it – there is a price consideration. Cheaper CD-R blanks are usually fine at up to four-speed but you'll probably need to use the more expensive certified discs if you plan to work at 8x and above.

Most manufacturers are now producing drives that connect to an IDE bus. This is definitely the largest market for new drives and the cheapest way to get up and running with CD-RW. However, we have experienced some write failure writing on-the-fly at maximum speed from a CD drive to a CD-RW. This can usually be overcome by lowering the write speed or buying a faster CD player.

USB connection is ideal if you're on the move but don't expect startling performance, they'll get the job done but you'll have to wait for it. Without doubt, a SCSI solution is still the best choice if you want maximum speed and reliability but be prepared to pay for it.

## BEST PERFORMANCE

### LG CED 8080B

■ PRICE £230 ■ EX VAT £196 ■ SUPPLIER LG UK ■ PHONE 0870 607 5544 ■ WWW lge.co.kr

**D**on't believe everything you read on the box. While the LG is rated at a write speed of 8x, it outperformed drives rated at 10x and 12x in our tests. When it came to rewriting speeds, only the Acer could compare.

The HP drive edged ahead in sheer writing speed, but fell back in the RW trials. It also can't over burn CDs, so you can't eke that extra few megabytes from your media.

We were surprised – if price reflected performance, the SCSI LaCie should have come tops in all the tests. The drive is excellent at reading CDs, and the fastest at copying them, but is puzzlingly slow when it comes to burning new disks and rewriting your backup CD-RWs. It was a tough call, but when it comes to real-life tasks, the LG has the oomph and features such as CD-Text and over burning to win the Performance Award.



Fast and furious – and expensive.

## BEST VALUE

### TEAC CD W54EK

■ PRICE £149 ■ EX VAT £127 ■ SUPPLIER Micro Warehouse ■ PHONE 0208 9069111 ■ WWW www.teac.de

**T**he cheapest drive of the bunch is the Teac coming in at £149 and despite only claiming a 4x4x32 performance, it returned reasonable performance. If you're interested in CD Text and over burning, this drive supports it but doesn't have over burn protection. Push it to the limit and you might stress the drive. We didn't experience any problems but you've been warned. On test it was marginally slower than the 8x4x32 drives when writing to CD-R but one of the quicker drives when using CD-RW. Copying a CD was about 30 per cent slower than the fastest drive.

One other bonus is the inclusion of Nero's Burning Rom software – one of the best software packages for specialist CD writing – making full use of Teac's over burning features and capable of working with most types of disc format. At this price and with the extended features, the Teac takes our Value Award.



A great bundle at a great price.

## BEST AVOIDED

### IOMEGA USB CD-RW

■ PRICE £229 ■ EX VAT £195 ■ SUPPLIER Iomega ■ PHONE 020 736 595 27 ■ WWW iomega-europe.com

It pains us to do it to a company with such a reputation as Iomega's, but we can't in all honesty recommend that you go for its USB external CD-RW drive. The whole concept of rewritable media is linked with the UDF filing system. Most people are going to the expense of buying not only the drive but also the more expensive media in order to use the drive as a removable storage device. Direct CD manages the UDF filing on CD-RW drives enabling them to work like any hard drive with full drag-and-drop and file erase features. To not use this facility defeats the object of buying the drive.



## PC Plus

## CTXPR960F monitor

A fine monitor at a very competitive price

PRICE £358 EX VAT £305 SUPPLIER Insight PHONE 01923 810 800 WWW www.ctxeurope.com

Things are hotting up in the 19-inch monitor arena. With greater competition, prices have dropped considerably and this size of monitor is rapidly taking the market place recently occupied by 17-inch monitors. We've seen some brilliant flat screen displays over the last few months. This CTX monitor is fitted with Sony's latest FD Trinitron tube, one of the best tubes we've come across.

Physically, the 960F is a beast weighing in at about 56lbs and not the sort of monitor to perch on a lightweight shelf. It comes with a selection of inputs including the standard D type VGA connector. The others are a simple USB connector that supplies the four USB ports, two at the rear of the monitor and two on the side, and five BNC connectors. Three of these are for RGB input and the other two for vertical and horizontal synchronisation.

On-screen display controls (OSD) are simple to set up and enable full control over the screen geometry, size, position and colour control.

Installation is simple. We plugged the monitor into our PC and it was recognised on start up by Win98 as a new plug-and-play monitor. It took us a few minutes to set up the screen. We chose the recommended maximum of

1,600x1,200 pixels. This can be pushed a bit further, but 1,600x1,200 produced the best image. It was only necessary to set up size and position because, at the default 89Hz vertical scan rate, the screen showed little pincushion or trapezoidal distortion – quite refreshing.

Initially, the perceived image seemed little better than many others that we've looked at. However, after a cup of tea, when we came back to look at it there was a noticeable improvement. It appears the monitor requires a warm up period to settle down and achieve optimum performance. One noticeable feature is the high contrast of the Sony Trinitron tube. It does produce full, rich blacks and saturated colours right through to a clean white, compared with many monitors that start at grey and end up at a tinted white. It is possible to adjust the colour temperature of the display which enables a degree of correction for the ambient light.

Not only is this one of the finest monitors we've tested, it's at the price you would have expected to pay for a 17-inch monitor last year. A great buy.

Paul Warner



Tested on Athlon with USB, Matrox G400 graphics card, Win98

## PC Plus

## VERDICT

## CTX PR960F

For One of the best images we've seen

Against Takes a little time to warm up to get the best image

Range of features.....9

Ease of use.....9

Documentation.....7

Performance.....9

Value for money.....10

9/10



## CD-ROM drive

## KENWOOD 72X TRUEX

The world's fastest CD-ROM drive

PRICE £99 EX VAT £84 SUPPLIER Kenwood PHONE 00353 61702000 WWW www.kenwoodtech.com

The multi-beam Kenwood sets new standards in CD-ROM performance.

Minimum requirements IDE interface  
Tested on Pentium II 500 with 128MB RAM,  
Win98 SE

## PC Plus

## VERDICT

## KENWOOD 72X TRUEX

For Incredible data transfer rates. Quiet

Against Expensive for a plain CD-ROM drive

Range of features.....8

Ease of use.....8

Documentation.....8

Performance.....10

Value for money.....7

8/10

Just when you thought that CD-ROM speed couldn't get any faster, along comes this Kenwood that claims to run at an unprecedented 72-speed. There are problems in achieving high-speed CD-ROM drives using the traditional method of acceleration – spinning the disk faster. As the rotational speed increases, so do problems with vibration. Kenwood uses a new technology which splits the laser beam into seven and reads seven pieces of information at once. The disk is spun at a maximum 5,100rpm and is a CLV (Constant Linear Velocity), so data retrieval rates are unaffected by the data's position on the disk. The result is a superbly fast CD-ROM drive which is pretty quiet, too.

The drive looks like any other and is of similar build quality to other mainstream internal IDE CD-ROM drives. The drive kit comes complete with cable, screws and an excellent manual. You also get a piece of freeware for ripping audio tracks from CDs and creating MP3s. There's no DOS driver, although this isn't such the annoyance it used to be.

We fully expected Kenwood's claims on performance to be far too high. If it really did run at 72-speed, you could copy a full audio CD to your hard drive in one minute. Our CD Tach benchmark reported an average speed of 61.4, not quite what Kenwood claims but still the fastest drive we've ever seen by a considerable margin, beating the claimed 50-speed plus drives which actually manage under 30 when tested. It also has a flat graph, the data transfer rate peaks quickly and is consistent for over three-quarters of the disk. We expected to have to take Kenwood's claim with a pinch of salt and were pleasantly surprised that it is, indeed, very fast.

The prices of CD-ROM drives are low at the moment, a decent 48-speed drive costs just £30. The Kenwood is three times that. Quite when you'll need such blistering performance is the question you have to ask yourself if you're thinking about splashing out on the Kenwood. If you need the speed then it's the business, if you don't, it's an expensive way to install Office faster.

Paul Warner

## PC Plus

The Agfa CL30 Klik! camera has rather brick-like looks.



## digital camera

# AGFA EPHOTO CL30 CLIK!

*How does this compare with more expensive cameras using CompactFlash memory cards?*

**Requirements** PC with P100 or higher, 32MB RAM, 100MB hard drive space, USB port, CD drive  
**Extra information** Comes with carrying case

The camera comes with a carry case, a decent manual and free non-rechargeable AA batteries. If you want a digital camera that enables you to take lots of pictures without messing around with expensive CompactFlash cards or low capacity floppies, the Agfa CL50 Klik! could be for you.

**Tony Browne**

PRICE £350 ■ EX VAT £298 ■ SUPPLIER Agfa UK ■ PHONE 020 8231 4903 ■ WWW www.agfa.co.uk

**C**ompactFlash memory cards that you can use in devices such as PDAs, digital cameras and MP3 players are fast at accessing data but they're expensive.

Digital camera manufacturers, aware of this, have come up with some novel alternatives. Enter the new ePhoto CL30 Klik! camera. This continues Agfa's tradition for innovative camera design with its built-in Klik! drive, replacing the usual CompactFlash-style reader or disk drive. Never heard of Klik! storage? You may have come across its maker, Iomega, which manufactures the Zip disk/drives. A Klik! disk is small, 2x2-inches, resembles a minidisk and can hold 40MB of information. A pack of two disks costs around £25 whereas the price of a comparable 80MB CompactFlash card costs around £160.

The ePhoto CL30 Klik! has the same specifications as the original ePhoto CL30 – a maximum resolution of one million pixels (1,152x864), a 30-bit colour depth and a 2x digital zoom. Additionally, this model features an optical viewfinder, an automatic flash and USB support so that images are transferred quicker to your PC compared to serial-based cameras. There is also a plastic covered 1.8-inch TFT LCD screen at the rear, which enables you to preview shots before you save them to the Klik! disk.

## Get a grip

Holding the camera to take pictures is a bit fiddly because the left-hand side only has a dimpled corner for you to grip which doesn't stop your fingers sliding about. By using the EasyPilot button, located next to the LCD display, you can navigate smoothly through the camera's advanced features such as the self-timer. This button moves up, down and, when depressed, acts as a selection picker in the camera's menu system. It's a shame that this interface doesn't look as polished as other budget cameras on the market, such as Kodak's DC range.

Agfa's Photowise 2.1 is the only software supplied with this package. Most cameras come with a free graphics manipulation program these days, even if they're budget models. Photowise is a user-friendly program – you can download pictures from your camera, arrange them into albums and alter them. These modifications include basic colour adjustment and cropping.

As you can see from the snapshots, pictures taken with this camera are bit pixelated because of



The faces of the tourists are quite blurred because of the Agfa CL30 Klik!'s low resolution and the fact that we're not using the digital zoom feature. Facial close-ups reveal that the camera is just above average at displaying skin tones in the budget digital camera class.

The Agfa CL30 Klik! manages to capture the different tones on the walls of Bath Abbey. Features of the building can be clearly seen and you can just pick out text located over the top of the white van thanks to excellent contrast.



To prevent scratches, the 1.8-inch TFT LCD screen has a clear plastic cover.

the low resolution of the Coupled Charge Device (CCD). Skin tones are quite accurate and contrast is well defined. Thanks to the Klik! disk's impressive storage capabilities, Agfa claims that you'll be able to get an amazing 360 images on one Klik! disk if you use the camera's lowest resolution (640x480). At the highest setting (1,152x864) you should get 120 images.

## PC Plus

## VERDICT

## AGFA EPHOTO CL30 CLIK!

For Lots of storage space, good price, easy-to-use software

Against Brick-like looks, image quality isn't the best

Range of features.....	7
Ease of use.....	6
Documentation.....	7
Performance.....	6
Value for money.....	8

**7/10**





## components

# DEVELOPER EXPRESS EXPRESSPRINTING SYSTEM 1.0

*A printing system which gives you plenty of power and flexibility*

**Minimum requirements** Pentium II with 16MB RAM, Win95/98 or NT

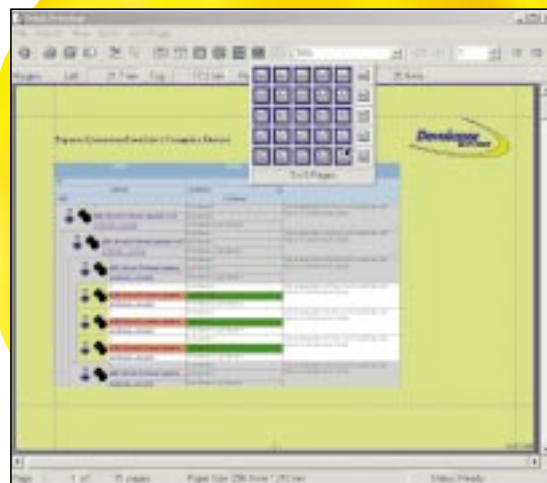
**Tested on** Pentium 500 with 256MB RAM, Win2000

**Available on** Web download

**Publisher** Developer Express Inc, [www.devexpress.com](http://www.devexpress.com)

**Additional information** Demo programs (but not trial components) are available from the Developer Express Web site

The ExpressPrinting System enables you to embed powerful print preview facilities into your applications, such as the dialog shown here.



■ **PRICE** \$179 (about £112) ■ **SUPPLIER** Developer Express ■ **WWW** [www.devexpress.com](http://www.devexpress.com)

**O**ver the last year or so, Developer Express has established a reputation as purveyors of high quality components for Delphi and C++ Builder programmers. It has, likewise, earned a reputation as being virtually the only mainstream component vendor who doesn't make available trial versions of its components. Despite this, you can download precompiled executable demo programs from the company Web site.

One of the latest offerings from Developer Express is the ExpressPrinting suite which is touted as being 'an advanced data presentation and visualisation system'. In plain English, the ExpressPrinting system makes it possible for you to add sophisticated print preview and print configuration options to your program. Nowadays, print preview is a facility that many users take for granted, but doing the job properly can often involve a tremendous amount of work for the developer. Using ExpressPrinting suite, it's possible to invoke a fancy looking preview dialog with just one line of code.

Although the ExpressPrinting system will work with any third party components, it has been designed to work especially well when used in conjunction with the other components available from Developer Express such as the QuantumGrid and QuantumTreeList items. When you invoke the print preview dialog, you'll see much of the functionality that you'd find in – for example – Microsoft Office. Thus, there are buttons to zoom the displayed page out to 100 per cent, fit it to the current dialog size and so on. There are buttons to view one, two or four pages side by side and, as with Microsoft applications, there's a Multiple Pages button (wrongly set up with a popup hint which reads 'Multiple Pages!') which leads to a popup dialog where an arbitrary arrangement of multiple pages can be selected. You (or rather, the user of your application) can control whether the preview dialog uses flat toolbar buttons, large toolbar buttons and so forth.

From a developer's perspective, the heart of the

ExpressPrinting System is the TdxComponentPrinter component. When you place this component on your design time form, you can then use a design-time editor to set up so-called 'report links' to those components whose contents you wish to print. In addition to the Developer Express components, there's also built-in support for TStringGrid, TDrawGrid, TListBox and TCheckBoxList. For each of these control classes, a specific type of report link is created. By manipulating these report links at design time, you

## The ExpressPrinting system lets you add sophisticated print preview and print configuration options to your program

can exert a great deal of flexibility over the appearance of the printed data. Moreover, the design-time editor can directly invoke the preview dialog, enabling you to experiment with different effects without the necessity of actually compiling and running the application. If you want, you can create your own custom report links which provide an interface between the printing system and other Delphi components you choose.

From the above, you'll have gathered that the ExpressPrinting System encompasses more than just printing – it also encompasses some of the functionality traditionally associated with a reporting tool. Accordingly, you'll find that there's a facility for setting the background colour of the printed page and there's even an option to 'tile' each printed page with a selected bitmap, the bitmaps on offer looking much like those on offer

in Microsoft Word's Fill Effects dialog. Finally, there's a Report Designer dialog, reached via the Print Preview dialog (and therefore accessible by the end user) which can be used to provide fine control over printing options on a per-component basis. Thus, the Report Design window associated with the QuantumTreeList control lets you alter the colours of grid lines and group nodes, enable/disable the printing of footers, grids, check marks and so on ad infinitum.

On the negative side, we experienced a somewhat unnerving crash once when invoking the print preview dialog: the program paused for several seconds before terminating unexpectedly while the sound system emitted a noise like something was frying! Fortunately, nothing apparently did fry and the event didn't reoccur.

The on-line help isn't up to the usual Developer Express standard and a tutorial wouldn't go amiss. Like all Developer Express products, full source code is included, and the ExpressPrinting system comes with on-line help and a number of demo programs.

**Dave Jewell**

### PC Plus

#### VERDICT

#### DEVELOPER EXPRESS EXPRESSPRINTING SYSTEM 1.0

*For A powerful printing system which puts a lot of flexibility into the hands of the end user*

*Against Poor documentation and Print Preview sometimes wants to make up its own mind about how many pages it's going to display*

Range of features.....	8
Ease of use .....	7
Documentation .....	4
Performance.....	7
Value for money .....	8

**8/10**



## web privacy

# ZERO-KNOWLEDGE SYSTEMS FREEDOM 1.1

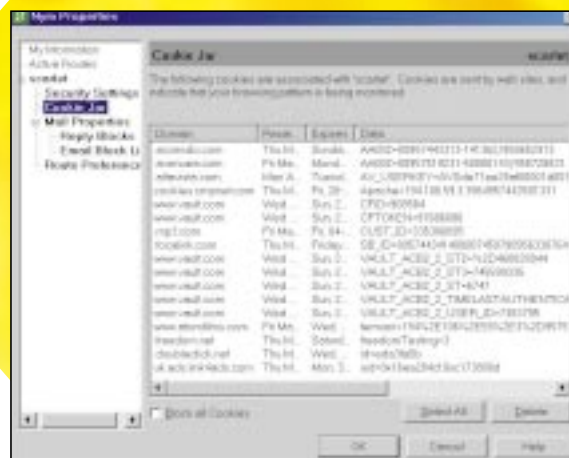
*The first product to offer full Internet privacy*

**Requirements** Pentium with 8MB RAM, Win95 or higher, 28.8K modem

**Tested on** Pentium II with 64MB RAM, Win98

**Extra information** The software itself is free – one 'nym' costs one 'token'; one token costs US \$10 (£6). You buy at least five initially, which last for 12 months

Freedom's cookie jar is probably the only one in the world that gets more full the more it gets used. It provides a fascinating insight into these innocent-sounding pieces of code. Note, for example, the expiry dates on those from [www.vault.com](http://www.vault.com).



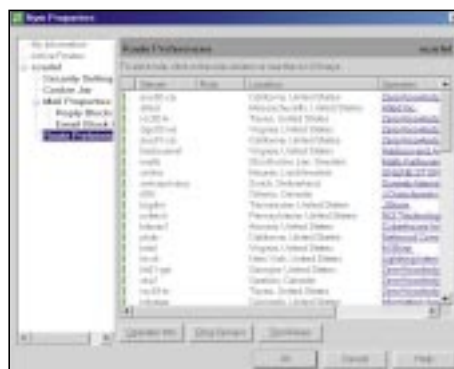
■ **PRICE** Starts at US \$50 (£30) for five tokens ■ **SUPPLIER** Zero-Knowledge Systems ■ **PHONE** 001 514 286 2636 ■ **WWW** [www.zeroknowledge.com](http://www.zeroknowledge.com)

**F**reedom raised more than a few eyebrows when it was first released a few months ago – not least from various law enforcement agencies who thought it might provide the perfect cover for criminal activity on the Net. One can see how such a paranoid view comes about – by using a system of aliases, called 'nyms', and strong encryption, Freedom completely protects your true identity while you're surfing, posting to newsgroups, sending e-mail, using IRC chat and Telnet. There's the added bonus of total protection from spam from known sources – it doesn't even reach your hard drive. All in all, it is the first product to offer comprehensive Internet privacy.

It's all based on 'nyms'. You can create multiple nyms to reflect your differing Net habits. Each nym has a unique encryption key and digital signature (which only you own – not even Zero-Knowledge has access to it) and exists as an independent 'digital citizen' on the Net. You decide what personal information you wish to reveal with each nym. You can also control cookie activity and provide Freedom with a list of words you don't want to leave your computer (for example, your address or phone number). But all this comes at a twin price – performance and reliability.

Freedom wraps the outgoing data from your PC in several layers of strong encryption and uses its own network of over 60 servers around the globe to detour your data. This means adding extra servers to your data's route so increasing latency time. If you opt for the most secure setting – using three Freedom servers to detour your data – performance is seriously undermined. On the test machine download times were more than tripled.

Worse, if you opt for three-server-security, the chances of Freedom 'losing' your private route is increased threefold as well. Even with one server this happens often enough to be extremely irksome. When this happens all data is blocked and Freedom pops up a dialogue which says you can either carry on with no privacy or close your Net connection, shut down all Internet applications,



**When planning your server route, choose servers with a low response rate that are geographically close to you. It's advisable to experiment with several different ones to get the best performance since performance is the single biggest gripe with this product.**

close Freedom and start again – a process which can take up to ten minutes. If you were in the middle of a long download, tough luck.

All this makes it seem Freedom is more trouble than it's worth, but it's not. True, using it every time you want to browse probably isn't wise, but you can use the 'cookie jar' and the 'nym' palette to decide when you should be using Freedom to browse. The cookie jar, a useful feature which tells you which sites put cookies on your hard drive and when they expire, gives a clue as to what they are for, as well as deleting ones you don't like the look of and blocking all cookies from all sites; the 'nym' palette tells you when a site is downloading a cookie on to your hard drive.

Freedom 1.0 fools the site you are connected to about where you are connected from and protects true identity and keeps these cookies associated with the nym you are using and no other.

But where Freedom 1.0 really comes into its own is in the fight against spam. Poor performance and patchy reliability aren't so much of a bind when using e-mail and posting to news groups. And the guaranteed anonymity you get means you can prevent spam merchants ever finding out your true identity. You can even block all spam from

known sources – it doesn't even reach your hard drive, it's intercepted by the Freedom network. You never even know it was sent.

It's also a relatively low-cost – \$50 for your first five tokens works out at around £30, but your credit card is charged in dollars. Its short(ish) download from the Zero-Knowledge site (just over 3MB), easy to install and use. Your hand is held all the way through the quite complex and lengthy installation and set up procedures. There's even an easy to follow tutorial explaining and demonstrating how Freedom works. And you can try it before you buy it.

Overall, you would have to be pretty concerned about your privacy to want to use Freedom all the time. By all means use the mail options and the news reader features to prevent spam (from known sources) ever reaching your hard drive and to post to newsgroups anonymously, but running Freedom when browsing will double or even triple download times, so choose when you do so carefully. Slow download times won't just stretch your wallet, they'll stretch your patience as well. Of course, when we all have broadband connections to the Net, products like Freedom will be de rigueur. But, if privacy is a serious worry for you now, you should try this product.

**Jason Thomas**

## PC Plus

### VERDICT

#### ZERO-KNOWLEDGE FREEDOM 1.0

**For Total Internet privacy and invaluable in the fight against spam**  
**Against Browsing performance more than halved, lost route incidence unacceptably high**

Range of features.....9  
Ease of use.....8  
Documentation.....7  
Performance.....5  
Value for money.....7

**7/10**



Tested on K6 2 400MHz

printer

## HEWLETT-PACKARD DESKJET 1220C SERIES

*How does Hewlett-Packard's A3 colour ink-jet printer compare with Epson's recent A3 offering?*

every time you replace an ink cartridge you get a new printhead assuring optimum print quality. Designed for professional use, it's ideally suited for high volume regular printing as well as quality photo printing. For general office printing in black text, HP claims that it is capable of a sustained duty cycle of 5,000 pages per month.

It's a large printer, using many of the design features of HP's latest A4 printers and comes with both parallel and USB ports. We chose to use the USB connection to try it out and, as soon as we hot plugged the USB cable into our test computer, a new USB device was recognised and Windows asked for the drivers. These were loaded off the software CD along with the printer toolkit software. This is used to set up the 1220C, install new cartridges and check connections.

When you first switch on the printer, it resets itself, quietly. Compared with the Epson 1270 we tested last month, the 1220C is almost inaudible. Only during the rapid paper advance do you hear any noise. This paper speed goes some way to increasing the printing performance times. Print speeds are quick and, in nearly every case, control was returned to the application in a few seconds, some almost instantly. In all our printer tests, except the very high-resolution mode, we found the HP to be faster than the Epson 1270.

We can only go on HP's claimed ink capacity but from its figures, it appears that the 1220C is relatively economical. It certainly has an impressive printing ability and would be an ideal choice for the discerning home user or office that requires both high quality graphics printing and a general workhorse, in all sizes up to A3. Hunt around and you should be able to pick it up for less than HP's recommended price – a great printer.

**Paul Warner**

**F**ollowing hard on the heels of last month's review of Epson's newest A3 colour printer comes this latest offering from its arch rival, Hewlett-Packard.

Full colour A3 printing was once the domain of specialist printers and design studios, but prices have dropped considerably. You can buy a printer like the HP Deskjet 1220C at the sort of price you'd would have paid for an A4 colour printer a couple of years ago. The real bonus is that all the printhead and paper path technology developed for the smaller A4 ink-jet printers has moved over to the larger A3 printers. Modern high-quality paper is now getting cheap enough to make it a viable option for general and photographic quality printing.

HP's technology differs from Epson's in the way ink is delivered to the paper. Instead of the Piezo electric head technology favoured by Epson, HP has remained with its classic ink-jet technology. The Piezo electric effect is produced when pressure is applied to certain materials producing a small voltage across them. The reverse effect produces a change in the size of the Piezo electric object when a voltage is applied creating sufficient displacement to move the printing ink. HP uses heating elements to vaporise minute droplets of ink creating a bubble to similar results.

Both systems have pros and cons. Until now, Epson has always managed to produce higher printing resolutions, at the expense of a start up cycle to purge and clean the heads. This wastes a small but quantifiable amount of ink every time you switch the printer on.

On the other hand, HP hasn't managed to achieve Epson's high resolutions until now. But the 1220C breaks new ground. Its quoted maximum resolution – 2,400x1,200dpi – is almost double that of Epson's photo mode. In practice, we found little noticeable improvement over the standard 600dpi mode. This could be

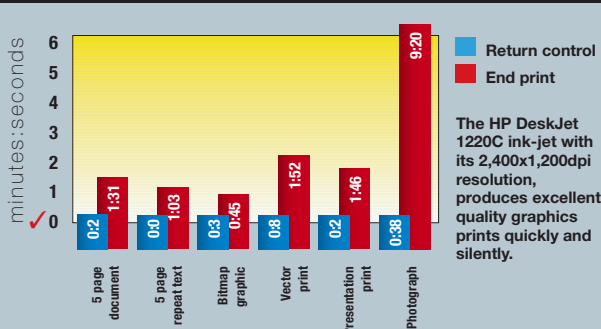
because using HP's PhotoRet technology is disabled at the highest resolutions. PhotoRet III uses as many as 29 drops of ink per dot and 17 shades of each primary colour producing excellent results at lower resolutions.

The 1220C has two paper trays at the front. The bottom one can take up to 150 sheets of paper at 64g/m<sup>2</sup> and 50 in the top tray. A manual feed at the rear will handle up 250g/m<sup>2</sup> weight, making it ideal for light card. The 1220C will handle paper up to 13x19 inches; this is considerably larger than A3 and, provided you can get the paper, enables you to produce a true A3 cropped image with printing from edge to edge.

One of this HP's main design advantages is that

### Full colour A3 printing was once the domain of specialist printers but prices have dropped considerably

#### PRINTER TEST RESULTS



#### PC Plus

#### VERDICT

##### HP DESKJET 1220C SERIES

For Great image quality, fast and silent

Against Nothing	
Range of features	10
Ease of use	9
Documentation	8
Performance	10
Value for money	9

**9/10**



## PC Plus

With Version 5, Nero has increased its reputation.



## CD burning

# NERO BURNING ROM VERSION 5



*A great bit of software at an affordable price*

**Tested on** Athlon 600MHz with 8x4x32 speed CD-R(W) writer on IDE bus

**Extra Information** A full demo version is also available for download from [www.ahead.de](http://www.ahead.de)



Nero's wizards show you step-by-step how to produce your CD.

**As it's one of the best all-round writing packages we've seen, it was hard to imagine what could be added to warrant a new release**



Using the latest MP3 encoder from the Fraunhofer Institute, you can compress files to a tenth of the original size.

software can read M3U play lists – editable lists of audio files in text format. With Nero you can now drag a play list into the compilation window and the list of tracks will be automatically added to the compilation.

A similar method is used to create Sound VQ files, using twin VQ audio compression. This produces a similar quality but the files occupy up to a third less space. Nero can add VQ, MP3 and .wav files into a compilation and burn them on-the-fly.

For those of you with a desire to copy odd formats, Nero includes full support for copying discs with the CD-Extra format and other multi-session CDs. At *PC Plus* we don't condone the copying of commercial CDs but with Nero you should be able to make personal backups of most CDs, just in case your two-year-old decides they're great fun to play with.

## Demo version

Take a quick look at the Ahead Web pages. You can download a demo version to give you an idea of how it works. The Nero software now supports plug-ins and, for \$15, you can buy its MP3-Encoder Plug-in. This uses an MP3 encoder

In our last roundup of CD-R and CD-RW software, Nero Burning ROM took a Gold Award as the best program for preparing and burning CDs. As it's one of the best all-round writing packages we've seen, it was hard to imagine what could be added to warrant a new release. The previous version included support for over-burning and even had a designer for labels and jewel case inserts. So what has been added to convince us that we can't live without the new release?

Nero now supports multiple burning so you can write to more than one disc at the same time. Although Padus' Disc Juggler has this feature as an option, it's considerably more expensive and requires the use of identical writers. Nero claims that improved multi-tasking has achieved greater stability and speed, enabling it to perform multiple writes.

Ahead has also extended the Video CD (VCD) standard to Super Video CD (SVCD). SVCD supports a bit rate that is double that of VCD and gives 35 minutes of playback on a standard CD. This is half the time available with VCD but gives DVD quality. However, don't expect Nero to do the encoding for you – you'll need a specialist program like VideoStudio to prepare the MPEG files for SVCD.

You'll find some new audio filters in the mix. The previous version had sophisticated filters built in to perform outlier detection (used to remove clicks and hisses from old audio recordings). Now it has added a karaoke filter to remove the vocal content of a track, and cross-fading to blend one track with the next. If you're creating audio CDs, you'll also be interested in Nero's CD Database support. This enables you to store information on the title and artist between the audio tracks as CD text. Many CD players can now display this information during playback.

MP3s have been stealing most of the audio headlines recently. They compress audio data into an area about one tenth of the original, with only minimum loss of information. Most MP3 playback

from the Fraunhofer Institute, the inventors of MP3. The demo version enables you to encode up to 30 .wav files or audio data tracks from CDs to the MP3 format.

The last time we reviewed Nero we were impressed, and this latest release incorporates new features that will only serve to increase its reputation. A great bit of software at an affordable price – worthy of a Gold Award.

**Paul Warner**

## PC Plus

## VERDICT

### NERO BURNING ROM VERSION 5

<b>For It just gets better</b>	
<b>Against Nothing</b>	
Range of features.....	9
Ease of use.....	9
Documentation.....	8
Performance.....	10
Value for money.....	10

**10/10**

PRICE \$69 plus \$9 shipping ■ DOWNLOAD PRICE \$49 ■ SUPPLIER Ahead ■ WWW [www.ahead.de](http://www.ahead.de)

The Pocket PC **operating system** from Microsoft has arrived. How does this newcomer compare to the rest of the market? Tony Browne tests 11 of the latest palm-sized PCs to find out

# Pick of the Pockets

## Group test: Personal Data Assistants

**Y**ou – yes, you – have got ants in your pants. It's the only possible explanation for this year's explosion in mobile computing. Manufacturers the world over are betting billions on your desire to create documents, edit presentations and access the Internet, all while you're walking down the street, sitting on the train or sipping coffee in a delightful little café bar on the outskirts of Istanbul. WAP phones are getting all the headlines but if you actually want to do anything useful, you'll need a PDA, aka a palmtop, pocket PC or hand-held PC.

The term PDA is a hangover from the days when the machines did little more than keep names, addresses and telephone numbers – much the same as a Filofax. Today's devices are essentially miniaturised PCs that can perform an amazing variety of tasks – comparing a PDA from this group test to a personal organiser is like comparing a Ferrari to a wheelbarrow.

If you're thinking about buying a PDA, the first question you should ask is: why do I need one? Form follows function – if you need to enter lots of text, buy one with a keyboard. If you want something you can slip into a shirt pocket, check out the keyboard-less palmtops. These two basic types of PDAs are very different. You can think of the former as a tiny laptop computer, whereas the latter is more like a digital notepad, with more than a few extra features, of course.

We've got five keyboard-based machines for you this month. They've all got built-in word processors, spreadsheets, contact databases, e-mail, Internet software and more. If you really want to get some work done while you're on the move, these are the guys to consider. We also have half a dozen keyboard-less, Palm-type devices. Thin, light and super-portable, these machines are quick and easy-to-use. Information is entered using a stylus on a touch-sensitive screen, using handwriting recognition or an on-screen keyboard.





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Along with the physical design, there is another factor that makes a huge difference to your choice of machine: the operating system. For keyboard-based machines, you get a choice between WinCE and Psion's EPOC. If you're used to Windows, WinCE will be easier to pick up, but EPOC is regarded by many as a superior operating system. Keyboard-less devices are available with Pocket PC (a version of WinCE) or the Palm operating system. The Palm OS has a huge fan club, and rightly so. It's lean, mean and wonderfully easy-to-use. Additionally, the Graffiti handwriting recognition is fast and accurate, although it does take practice to perfect your skills. Pocket PC is Microsoft's newest mobile operating system and is a great improvement on version 2 of CE.

In all cases, the operating system you go for should be, quite simply, the one you prefer. How do you choose? Read this feature, then pop down to your local computer store and make a nuisance of yourself. They are expensive devices, so you're well within your rights to play about with them for as long as you need.

All the devices share certain functions such as contact lists, voice recording, alarms and the essential instant-on function. Once you have decided on the shape and operating system, the factors that really make a machine stand out from the crowd depend on your own particular needs. Do you need colour or will a cheaper monochrome screen do the job? Is battery life important – will you be away from your desk for days at a time? Memory can make a big difference – how much information do you need to store? All these questions, and more, are answered on the following pages. Read on to discover the perfect PDA for you.

#### THE NEXT GENERATION

## First Linux-powered PDA

*Is Samsung YOPY palm-size, the personal data assistant to beat all others?*

Last year we received an interesting e-mail with an URL on it. Eagerly, we entered [www.sem.samsung.co.kr/eng/product/digital/pda/](http://www.sem.samsung.co.kr/eng/product/digital/pda/) into our machines and there was a PDA from Samsung, a company that currently isn't in the crowded PDA marketplace. This new model looks about the same size as the Casio E-115 but it had a lot more curves. Displayed near the blurred photo is a table of specifications. Nothing in here seemed out of the ordinary. That is until we looked at the operating system section and saw the words: ARMLinux OS.

This new device runs on the Linux open source operating system. The new mobile processor is called Transmeta and the YOPY will use a 206MHz ARM chip. Not only does it have a fast processor, there is also a generous 32MB of



RAM. The Linux OS is stored on the 32MB of Flash ROM. Power is provided by a Lithium-Ion battery and connectivity to a

PC will be via a USB-based docking cradle.

Any PDA, especially a new one based on a new platform will need software. There is no sign of an office-type suite but there is a Web browser, a game and a MP3 playing facility, something that no modern personal computer could do without. A CompactFlash card slot is available and a TV tuner plus digital camera have already been designed. The PDA sector could be in for a major shake-up and we here at PC Plus can't wait to review this device later on this year.

## CASIO CASSIOPEIA E-115

[www.casio.co.uk](http://www.casio.co.uk)



### The first Pocket PC PDA in this roundup is an upgrade of the highly rated Cassiopeia E-105

■ PRICE £500 ■ EX VAT £426 ■ SUPPLIER Casio ■ PHONE 020 8450 9131

**Technical specifications** 131MIPS processor, 32MB RAM, 32MB ROM

**Additional Software** Support for Casio mobile camera and mobile video converter **Extras** Carrying case

Mention the name Casio and most people would think of clever watches and calculators, but this electronic giant also makes palm-size devices. The Cassiopeia E-105 received a Gold Award from *PC Plus* in issue 157 and this gives the new E-115, which uses Microsoft's new Pocket PC operating system, a sound base.

The new E-115 looks so much like its predecessor that you'd be forced to play spot the difference if the two were lined up side-by-side. Unlike the slick looking HP Jornada 545 – another Pocket PC-based device featured here – Casio has decided that evolution rather than revolution is the name of the game when it comes to looks. In essence, the exterior of this new Casio is the same as the older model but a different colour.

Using the Pocket PC operating system takes a bit of getting used to and, although you'll find it's better than WinCE, it's still not as user-friendly as the EPOC and Palm interfaces. Despite Casio trying to improve this situation with a menu system that brings up your favourite applications, it isn't as good as the Home File system on the HP Jornada 545.

The Casio also misses out on HP's character recognition software, which lets you scribble words anywhere on the screen. However, the traditional E-series buttons make a welcome return and include games, calendar and contacts buttons plus a directional controller. The stylus doesn't compare particularly well with the rest of the group, and you only get a black fabric cover instead of the leather cases you get with the cheaper Handspring Visor and Palm Vx.

The performance of the E-115 is quite brisk. With a fast 131 MIPS processor, this device loads up instantly – and games and other resource-hungry applications won't run out of memory too soon, thanks to the 32MB of RAM on-board.

Being a Microsoft-based device, the E-115 uses ActivSync to transfer data over to your PIM program. You also get a serial-based docking base, but it is slower than the USB cradle used on the Jornada 545.

The E-115's display is clear, it has good sound quality and a few nice touches such as support for Casio's video playing format, but its dated looks, sparse documentation and high cost count against it.

#### PC Plus

#### VERDICT

##### CASIO CASSIOPEIA E-115

*For Small size, great display and good performance*

*Against Design and dated looks. Expensive*

Range of features.....	8
Ease of use.....	7
Documentation.....	7
Performance.....	9
Value for money.....	7

**8/10**



## COMPAQ AERO 1550

[www.compaq.co.uk](http://www.compaq.co.uk)



## ERICSSON MC218

[www.ericsson.co.uk](http://www.ericsson.co.uk)

### The Aero 1550 looks good but does this make it a Pocket PC winner?

■ PRICE £263 ■ EX VAT £224 ■ SUPPLIER Compaq ■ PHONE 0845 270 4000

**Technical specifications** 70 MHz MIPS R4111 processor, 16MB RAM, 16MB ROM  
**Extras** Carrying case

**C**ompaq has a great computing history but it hasn't had a runaway success with its range of Microsoft-based PDAs. Will the addition of the new Compaq Aero 1550, equipped with the Pocket PC operating system, make any difference to its sales figures?

This Aero device looks great – the case comes in chic-looking brushed metal. Furthermore, it's extremely thin, measuring only 1.2cm deep which is about half the size of the Casio E-115. The only thing that disappointed us is that it looks exactly the same as previous Aero models.

Just like HP and Casio, Compaq has decided that the Pocket PC platform needs a bit of help when it comes to user-friendliness, so it has come up with 'Q' pop up menu. Pressing the Q button on the side activates this and a menu brings up commonly-used programs such as the Windows Media player and File Explorer. You can also jump to Quilites, which enables you to set the contrast, pick game keys and run diagnostics.

All these functions are viewed using the monochrome display. This is one of the first things you'll notice about this new model. The display can only be described as average – it is slightly better than the Psion Series 5mx and Ericsson MC218 but it doesn't match the Palms or the Visor Deluxe in terms of visual quality. The sound quality of the Aero 1550 is also average and doesn't live up to the volume output of the Casio E-115. Input is done via the stylus and soft keyboard. There is also a character recognition system but it isn't as good as the word-based system found on the Jornada 545 or Palm's Graffiti.

Thanks to the fast MIPS processor and a healthy amount of RAM (16MB), the performance of the Pocket PC operating system is equal to the Casio E-115 and HP Jornada 545. However, Compaq has been mean on the software front. It only provides MS Outlook 2000 whilst other PDA manufacturers supply lots of third party applications and demos. You do, however, get a leather case which, although it's not great looking, will protect your new investment.

So what's the verdict? Although the Aero 1550 has good looks and performance on its side, it seems like a model that is coming to the end of its production life. Given the choice, we would go for the Casio E-115 or HP Jornada 545.

#### PC Plus

##### VERDICT

#### COMPAQ AERO

**For** Thin design, long battery life, cover case

**Against** Monochrome display, design starting to date

Range of features.....7  
Ease of use.....7  
Documentation.....6  
Performance.....8  
Value for money.....7

7/10

### Ericsson's MC218 looks and acts like the Psion Series 5mx but which one is best?

■ PRICE £430 ■ EX VAT £366 ■ SUPPLIER Ericsson ■ PHONE 08705 237237

**Technical specifications** 36MHz Arm 710 processor, 16MB RAM  
**Additional software** EPOC Connect, My Pocket, WAP Browser, Offline Web

**R**ealising that this market has massive potential, Ericsson joined the Symbian Group, which contains Psion, Sony and Nokia. Ericsson has come up with the MC218, which is basically a rebadged Psion Series 5mx. It has the same hardware in the form of a monochrome backlit LCD display, a familiar 36MHz RAM processor 710 made by Cirrus Logic and 16MB of RAM.

What makes this PDA stand out is that Ericsson wanted a device that is linked more closely to its core business: mobile telephones. Ericsson cleverly solved this problem in a few ways – one of most obvious differences between this and the Series 5mx is that this device comes with a modem. This isn't built-in but comes in the form of a M128 infra-red device which fits on to most of Ericsson's current mobile phone range. If you have an older Ericsson phone, it will swap the modem for a suitable one at no cost.

When you open the clamshell case, a few differences between the Series 5mx and the MC218 are presented. The most obvious change is the silkscreens – iconic buttons hidden underneath glass – that surround the monochrome LCD screen. The icons found on the left have the same purpose as the icons on the Series 5mx but here they have been jazzed up, making them look more informal. The Orange system icon found on the Series 5mx has been changed to the desktop and the usual selection of Word, Sheet, Contacts and Email messages remain.

In addition to these programs, you'll find My Phone. This enables you to connect to your mobile and swap numbers between devices by interrogating your mobile's address book. You can also program new tunes into certain Ericsson phones if you desire. Unlike the Series 5mx, the MC218 comes with its Web browser pre-installed. To help this device in its quest to become the best data/telephone device on the market, there's also a WAP browser on the CD-ROM. To synchronise data between your MC218 and desktop PC, you'll find a copy of EPOC Connect. This is basically Psion's PsiWin under another name.

Comparing this device with the Series 5mx, the Ericsson wins our vote. You get a long battery life, built-in dictaphone and excellent keyboard. Furthermore, it has an improved software suite and you get an infra-red modem and a case. All the MC218 really needs is a decent manual – the one supplied is poor.

#### PC Plus

##### VERDICT

#### ERICSSON MC218

**For** Easy-to-use, very powerful, yet compact

**Against** The screen is not very clear in some lighting conditions

Range of features.....9  
Ease of use.....8  
Documentation.....7  
Performance.....8  
Value for money.....8

9/10



## HANDSPRING VISOR DELUXE

[www.handspring.com](http://www.handspring.com)

## HEWLETT-PACKARD JORNADA 545

[www.hp.com](http://www.hp.com)

### The new kid on the block looks to beat the Palm on price and looks

■ PRICE £200 ■ EX VAT £169 ■ SUPPLIER Handspring UK ■ PHONE 0207 3090 134

**Technical specifications** 20MHz Motorola DragonBall Processor, 8MB RAM, 8MB ROM **Additional software** Palm Desktop software, PocketMirror for MS Outlook Synchronisation **Extras** Leather carrying case

**A**lthough Handspring is the new kid on the PDA block, it would be unfair to say that it knows nothing about personal computing. Donna Dubinsky and Jeff Hawkins, founding members of the company, were previously employed on the Palm 'dream team'.

Unlike the standard Visor and Visor Solo, this Deluxe model comes with a USB docking cradle, two cases (one in leather) and 8MB of RAM. This is a huge amount for an appliance running the Palm operating system. The Visor uses the older 3.1 version of this platform with updated support for the USB-equipped docking station. This OS can't be upgraded as easily as the Palm Vx and Ilc because Visors don't have Flash ROM chips, but version 3.1 is well proven and it works fine in tandem with the fast Motorola Dragonball processor.

Visors will run most of the software written for Palms, however the Palm range doesn't have the proprietary Springboard slot, featured at the rear of this device. Springboard modules are hot swappable, so any software needed is loaded in when you insert the cartridge and unloaded from memory when it is removed. This amount of expansion has never been seen before in palm-size circles. A wave of pagers, games, modems and other useful gadgets is promised soon.

The exterior case of a Visor is a great talking point because you can order it in a range of iMac-like colours. Thanks to the Springboard slot, the Visor is slightly bigger than a Palm Ilc but it will still fit easily into a coat pocket. Inputting data is done via stylus and Graffiti, Palm's clever character recognition technique; displaying images is the job of a great monochrome LCD screen with a resolution of 160x160.

After powering up, you'll find some slightly different software to the Palm Vx and Ilc featured in this review. For example, there is an upgraded scheduling program called DateBook+ that enables you to see several sections of the address book (such as today's appointments and the To-do list) simultaneously. Documentation is sparse, but this doesn't detract from the fact that the Visor Deluxe has superb expandability and is available for a fraction of the price of the Palm Vx, its nearest competitor. Add to this its smart looks plus good performance, and the competition has every right to be worried.

### PC Plus

#### VERDICT

##### HANDSPRING VISOR DELUXE

**For** Small size, good display and fast performance

**Against** Looks may not suit all. No

Flash upgradeable ROM

Range of features.....8

Ease of use.....9

Documentation.....7

Performance.....8

Value for money.....9

8/10

### HP have gone back to the drawing board with the Pocket PC-powered Jornada 545

■ PRICE £369 ■ EX VAT £314 ■ SUPPLIER Hewlett-Packard ■ PHONE 0990 474 747

**Technical specifications** 133 Hitachi processor, 16MB RAM, 16MB ROM **Additional software** Free trials AOL, ZioSoft Golf, HPC Notes, Image Expert 2.0 **Extras** Serial cable, headphones

**D**id you see the last James Bond film, *The World is Not Enough*? If you did, you'll have seen the ageless super hero using a Jornada 430. If James liked the old model, he'll love the new Jornada 545. This handy little PDA uses the new Pocket PC operating system plus a fast Hitachi processor and 16MB of RAM.

This device has a neat, chic-looking metallic casing. Unfortunately, after you lift the cover, you'll come across the stylus, which is definitely the worst looking of the group. Having lifted the lid, you'll also be presented with the LCD display. This is bright and clear and our only beef here is that, despite HP's clever presets for different situations, we couldn't see the display in direct sunlight.

Underneath this, you'll find five buttons: Home, Contacts, Calendar, Tasks and the power button. Home takes you to a special HP folder which contains all your favourite programs. The others are shortcuts to the Outlook sub-sections.

The claimed battery life of the Jornada 545 is eight hours, we managed seven hours use on a full charge. Connection to your PC comes via MS ActiveSync and a USB cradle. This new method of transferring data greatly speeds up installing new programs. There is also a supplied serial cable that plugs straight into the bottom of the Jornada, plus a set of headphones so you can listen to MP3s on the move.

This device is reasonably easy-to-use, but it takes a little adjusting to because the operating system keeps closing down programs and opening them up on your behalf. It's slightly faster than WinCE but, on the whole, it doesn't seem to have changed that much.

There's loads of useful software in this package, including connection software for AOL, Image Expert, a golf game trial, plus a handy word recognition program that enables you to scribble anywhere on-screen. The build quality is good and the documentation, as you would expect from HP, is excellent. The Jornada 545's features are comparable with the Casio E-115, yet this PDA comes with better looks and a lower price tag.

### PC Plus

#### VERDICT

##### HEWLETT-PACKARD JORNADA 545

**For** Free software, improved battery life and excellent handwriting recognition software

**Against** Can be confusing if you're familiar with the older WinCE system due to navigational changes

Range of features.....8

Ease of use.....7

Documentation.....9

Performance.....8

Value for money.....9

9/10





**HEWLETT-PACKARD  
JORNADA 690**

[www.hp.com](http://www.hp.com)

**PALM  
IIIc**

[www.palm.com](http://www.palm.com)



**Great HP software, small size and some neat touches**

■ PRICE £645 ■ EX VAT £549 ■ SUPPLIER Hewlett-Packard ■ PHONE 0990 474 747

**Technical specifications** 133MHz Hitachi SH3 processor, 32MB RAM, 16MB ROM  
**Additional software** HP viewer, HP Dialler, HP Note Pad and backup, free software trials **Extras** Docking station

**T**here are three big name manufacturers that make WinCE/Pocket PC devices and only Hewlett-Packard has been successful with WinCE PDAs that have keyboards. How does the Jornada 690 do against similar machines such as the Psion Series 5mx/Ericsson MC218 twins?

The 32MB Jornada 690 gets off to a good start. One of the main complaints about previous WinCE hand-helds is that they've been too large but this Jornada is just under an inch bigger than the Psion 5mx and Ericsson MC218. It is quite a bit heavier, however, because of the rechargeable Lithium-Ion batteries. You'll get eight hours power out of these on a full charge. You can charge the Jornada 690 up by using the docking station and power supply that are supplied.

Open up the purple Jornada 690, and you'll see a colour screen display and a small keyboard. The screen isn't the best colour display – it's bright enough but the quality depends on your lighting environment. The keyboard is also not a strong point – whilst they have a nice action, the keys are smaller than those on a Series 5mx.

The Stylus can't be faulted, however – it has a silver top and clicks neatly out of its holder. Opposite the stylus are the dictaphone controls; next to them is a slider which covers the record button amongst others so conversations aren't taped whilst on the go; next to the display, you'll find some HP hot keys. Press these and you'll have access to regularly used features such as colour, contrast and volume. Below this are page up and down buttons and a neat task switcher.

Turn the Jornada 690 upside down and you'll find a Type II PC card slot, so you can add a variety of different peripherals including external drives. There's a CompactFlash card aperture built-in, so you can add more memory and devices such as the IBM Microdrive, if you wish.

The preloaded software includes the PocketOffice suite, and a whole host of very useful HP applications. This device has great instructions plus brilliant build quality and it would be a world-beater, if it were similarly priced to the Psion 5mx. The truth is that the HP Jornada 690 is priced nearer to the superior Psion Series 7, so we have trouble recommending it.

**PC Plus**

**VERDICT**

**HEWLETT-PACKARD  
JORNADA 690**

**For Great HP software, small size and clever compact Flash/Type II port**  
**Against Poor screen and a small keyboard**  
Range of features.....8  
Ease of use.....8  
Documentation.....9  
Performance.....7  
Value for money.....7

**7/10**

**Palm has introduced a new version of its popular operating system with the IIIc**

■ PRICE £350 ■ EX VAT £298 ■ SUPPLIER Palm UK ■ PHONE 0207 3659 820

**Technical specifications** 20MHz DragonBall processor, 8MB RAM, 8MB ROM Palm OS 3.5  
**Additional software** Pocket Mirror, Palm Desktop **Extras** Flap cover

**P**alm introduced its digital personal organiser to the world in 1996. Four years later, the Palm IIIc is the company's first model with a colour screen. This addition makes for a better-looking display but, unfortunately, it shortens battery life. Palm claims that it has solved this problem with the Palm IIIc's release.

By using a Lithium-Ion battery, this device should go on for two weeks without a recharge. Dock the Palm IIIc into its cradle daily and you'll rarely see a low power indicator because the serial-based synchronising unit also acts as a built-in trickle charger.

One of the reasons why Palms are so popular is that they are easy-to-use. This hasn't changed here, with the fast, fire-breathing DragonBall processor and 8MB of RAM, there is loads of room and power for third party applications.

Many people see their Palms as fashion items – especially after the launch of the translucent IIIe and smart looking Vx. In this area, the IIIc disappoints, as it is clothed in plain black. There is a flap that covers the screen and, as the IIIc is based on the IIIe, it fits lots of Palm accessories.

The battery metre has been spruced up and there are also subtle changes such as the ability to see tasks and appointments in one view in Datebook. Palm has cleverly opted to have a Flash upgradeable ROM in this device, so you can update the IIIc in the future.

The IIIc uses the Grafitti system for input. This may seem a bit unnatural at first, but once you have mastered it, editing small snippets of text is a breeze. Furthermore, this item has a nice weighty metal stylus and the manuals supplied are of the highest level.

The Palm IIIc is a reasonable device but the HP Jornada 545 is available for around the same price with more facilities, including the ability to accept CompactFlash cards so you can add more memory for items like MP3 files – something the Palm IIIc cannot do.

There is also no Office Suite available for Palms so you can't really do any office work on the move. You can, of course, write memos or e-mails and you can view MS Word and MS Excel files via third party software. The IIIc isn't the best choice if you put form before function.

**PC Plus**

**VERDICT**

**PALM IIIc**

**For First colour Palm, small size, and good performance**  
**Against Picture quality could be better. Heavy for a Palm.**  
Dark case  
Range of features .....6  
Ease of use.....8  
Documentation .....8  
Performance.....7  
Value for money.....7

**7/10**



**PALM  
VX**

[www.palm.com](http://www.palm.com)



**PSION  
REVO**

[www.pSION.com](http://www.pSION.com)

**This version comes with the latest version of the Palm OS: version 3.5**

■ PRICE £300 ■ EX VAT £255 ■ SUPPLIER Palm UK ■ PHONE 0207 3659 820

**Technical specifications** 20MHz DragonBall processor, 8MB RAM, 8MB ROM, Palm OS 3.5  
**Additional software** PocketMirror (links to Microsoft Outlook) Extras Leather case

**T**his miniature beauty is dressed in a high gloss metallic finish which Palm is, understandably, proud of. But wait, doesn't this look like the Palm V? The answer is yes – they both share the same case and this newer model is now sold next to the old. Both devices have the same unusually placed contrast button and two stylus holders, which means that they can be used by the left-handed. Cleverly, these stylus holders also act as a hinge for the flimsy leather case.

One of the advantages of this model over the Palm V is that it comes with the latest version of the Palm OS: version 3.5. As well as having support for colour, the address book is improved and HotSyncing is quicker. There have also been developments on the graphics front and icons, including the power gauge, to make them look a lot smarter. The Palm Vx has 8MB of RAM, a massive amount for a computer that is so miserly with its memory resources. This means you can install lots of games and other pieces of useful software.

As colour is reserved for the Ilc, the Palm Vx has to make do with a monochrome 160x160 resolution display. This isn't so much of a problem because it has one of the clearest screens that you'll find on a mobile computer.

Once again, the main input method of this Palm is Graffiti, Palm's propriety input system. If you so desire, you can also use a soft keyboard, which you'll find by pressing the File silkscreen icon. The stylus of the Vx isn't as aesthetically pleasing as the one bundled with the Ilc machine, nor is it as heavy. Both styli still have a top section that unscrews from the main body, which can be used to press the reset switch at the rear. Powering the Vx is a very thin Lithium-Ion battery that is charged when the device is in its HotSync cradle. It doesn't take long to top up the power and, if you're away from your desktop, at least you'll know that your batteries will last for a month if you use this Palm for about an hour a day.

When compared with the display of the Ilc, this monochrome model is much better. We would even go as far as to say that it beats the Handspring in the clarity stakes. The Palm Vx falls down, however, when you look at its price. The Visor Deluxe is nearly £100 cheaper and comes with better expandability. The Palm Vx has a slight edge on looks and a better display. We think that the Palm Vx is great but is it worth £100 more than the HandSpring? Our answer has to be no.

**PC Plus**

**VERDICT**

<b>PALM VX</b>	
<i>For Tiny size, good display and smart looks</i>	
<i>Against Expensive compared with Handspring Deluxe</i>	
Range of features.....	7
Ease of use.....	8
Documentation.....	7
Performance.....	8
Value for money.....	7

**8/10**

**Psion's Revo is petite but it still has a keyboard and it compares well to its brothers**

■ PRICE £300 ■ EX VAT £255 ■ SUPPLIER Psion ■ PHONE 0870 1010 500

**Technical specifications** 36MHz ARM 710 processor, 8MB RAM  
**Extras** Software for Psion's ISP, Psion.net

**I**f you like to look cool, then the Psion Revo is for you. The smart looking chrome and blue clamshell exterior only measures 157x79x18mm and weighs 200g, so it's small enough to fit into a trouser or shirt pocket.

Like all Psion products, the Revo uses the user-friendly EPOC 32-bit operating system. EPOC uses a file and folders-based interface that is easier to use than WinCE. Furthermore, it is much more stable and efficient than Microsoft's PDA operating system, so the Revo's 8MB of RAM goes a long way. It has to be because there is no way to expand this gadget– it doesn't have add-in memory slots or CompactFlash interfaces. There are no voice recording facilities, either. If you want these features then you'll need a Series 5mx.

The Revo uses a serial-based docking station that you can also use for recharging the two built-in batteries. Whilst docked, it's easy to see Psion's famous sliding keyboard, a design that has been patented. Unfortunately, this version is the worst. It is easier to use than Palm's Graffiti input system but don't expect to be writing essays on the move.

A major plus point is the monochrome display that provides much better contrast than the LCD screen found on the Series 5mx. This 480x160 display is backed with yellow, just like the Handspring and it seems that Psion is finally addressing one of its weak spots. However, because the Revo's screen is smaller than the Series 5mx, some software that is designed for the Revo's bigger brother may not run on the Revo. Unique to the Revo are a mobile phone management program and a Today view. This tells you about any appointments and tasks at the beginning of the day. Connection to your PC is easy if you want to synchronise data between desktop programs like MS Outlook because you can use Psion's useful PsiWin 2.31 linking software. Word is still there but the spell checker has to be loaded from the CD-ROM. Sketch is missing and the game, Bombs, is replaced by Cascade.

The processing performance of the Revo is good and the documentation is up to Psion's usual high standards. Battery life is also quite impressive but the Revo lacks a backlight and it is expensive. Accept these flaws and you'll have a capable machine in your hands.

**PC Plus**

**VERDICT**

<b>PSION REVO</b>	
<i>For Small size, great display and good performance</i>	
<i>Against Poor keyboard and no backlight. Pricey.</i>	
Range of features.....	8
Ease of use.....	8
Documentation.....	8
Performance.....	8
Value for money.....	7

**8/10**



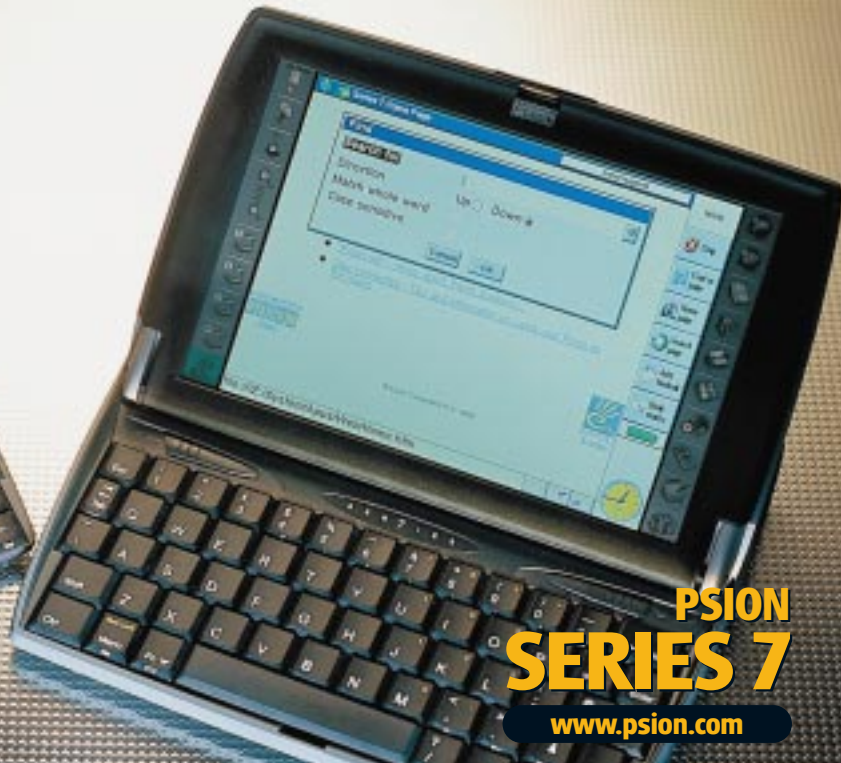
# PSION SERIES 5MX

www.pSION.com



# PSION SERIES 7

www.pSION.com



## The Series 5mx is easy to operate and comes with a fully-functioning office suite

■ PRICE £430 ■ EX VAT £366 ■ SUPPLIER Psion ■ PHONE 0870 1010 500

**Technical specifications** 36MHz ARM 710 processor, 16MB RAM, 10MB ROM **Additional software** PsiWin 2.31, Web browser, Java machine for the Internet **Extras** Software for Psion's ISP, Psion.net

**T**his model was released in the middle of last year as a successor to the original Series 5. The Series 5mx uses the 32-bit EPOC operating system that offers significant gains in usability over WinCE machines. With its 16MB of RAM, it has double the amount of RAM of its predecessor and the ARM 710 processor now runs twice as fast as it did before.

The Series 5mx is easy to operate and comes with a fully functioning office suite that includes Word, Sheet, Data and a Contacts database. There's also a Jotter for quick notes and a simple sketching program. This software package is easier to use than PocketOffice, which you'll find on the Casio E-115 and HP Jornada 545.

If you're thinking of moving from an old WinCE machine you'll be amazed at the versatility of some of these programs. For example, there is a built-in word counter, a thesaurus, and support for inserting tables and pictorial information thanks to the EPOC's ability to insert objects such as spreadsheets or pictures into files.

Sharp-eyed readers may notice that this hand-held looks similar to the old Series 5 but the peeling, rubberised paint has given way to a new, shiny look. The clamshell cover resembles a spectacles case and, once you open it, you'll find a neat keyboard and large, monochrome, 640x240 screen.

This device has a great keyboard and you'll find you can type out a decent sized e-mail or Word document quickly. The stylus will also enable you to select items on screen. This Psion's Achilles Heel is, unfortunately, the display. Whilst it's fine in optimal lighting conditions, it's not as clear as the Revo or the Palm-based devices.

The battery life of the Series 5mx is amazing when compared with a resource-hungry WinCE hand-held machine like the Jornada 690. On two ordinary AA batteries you'll get a month's use. You even get a built-in voice recorder, which is operated by buttons at the front of the device.

However, there are several weaknesses in the 5mx's portfolio: there are built-in programs for sending/receiving e-mails plus browsing the Internet but no built-in modem; and the screen isn't perfect and it looks dated without colour. The Ericsson MC218 is better value, so it wins the battle of the EPOC giants.

### PC Plus

#### VERDICT

##### PSION SERIES 5MX

**For** Small size, great performance and fully featured

**Against** Pricey compared with Ericsson. No colour or modem

Range of features.....	8
Ease of use.....	8
Documentation.....	9
Performance.....	8
Value for money.....	8

8/10

## The Series 7 is the perfect replacement for a bulky laptop

■ PRICE £700 ■ EX VAT £596 ■ SUPPLIER Psion ■ PHONE 0870 1010 500

**Technical specifications** 133 StrongARM processor, 16MB RAM **Additional Items** PsiWin 2.3

**P**SION's latest model is much larger than the older Series 5mx and dinky Revo but it's smaller than most laptops. We would be surprised if you couldn't get it into your favourite rucksack, however.

The design of this device's exterior looks great in blue leather. On the left-hand side, you can see the CompactFlash slot, a serial connector and an opening for the battery. As the CompactFlash interface is a sliding tray, certain makes such as Casio's can't use it. The right-hand side houses a power connector and Type II PC card port, so that you'll soon be able to link this device to network cards and modems.

The methods of entry used by the Series 7 are the trusty stylus and keyboard. On this model, the stylus glides out when you use the right-hand slider. This will hopefully stop the stylus sticking problem that used to plague the original Series 5. The keyboard deserves a special mention. It isn't the most positive action we've ever typed on, but it's still good for a mobile computer. It is certainly better than the Psion Series 5mx because the keys are much bigger, so typing longer documents should prove no problem.

The 7.7-inch colour screen is bright and, thanks to the clever hinge, you can angle the picture to whatever position you want without suffering light interference. Additionally, the familiar Psion silkscreens have now moved to either side of the screen. You can access the Web browser without resorting to the extras bar and you can assign any program to one of the four user-definable options. Our only slight disappointment is that this model is so much like the Series 5mx in use.

If you're coming to this machine from a WinCE device then you'll be amazed at how easy the EPOC operating system is to use. The powerful Office suite is excellent but it's not changed much from the seminal Series 5mx. The battery life of the Series 7 is quite impressive – especially if you're a full-sized notebook owner. It can go for eight hours without recharging through the use of Lithium-ion batteries. General performance is also good, thanks to the 133MHz StrongARM processor and 16MB of RAM, so you won't be left waiting for the hourglass to disappear.

If you need colour plus a great keyboard, then the Psion Series 7 is for you. It's too big to fit in a pocket but it may be just the thing if you're looking for a laptop replacement.

### PC Plus

#### VERDICT

##### PSION SERIES 7

**For** Brilliant keyboard, colour display and good battery life

**Against** Expensive. Applications are very similar to Series 5mx

Range of features.....	8
Ease of use.....	8
Documentation.....	9
Performance.....	9
Value for money.....	7

8/10





PC PLUS PRODUCT FACTS

Manufacturer	Casio	Compaq	Ericsson	HandSpring	Hewlett-Packard
Model	Casiopeia E-115	Aero 1550	MC-218	Visor Deluxe	Jornada 545
Price inc VAT	£500	£263	£430	£200	£369
Price ex VAT	£426	£224	£366	£169	£314
Telephone	0208 4509 131	0845 270 4000	08705 237 237	0207 3090 134	0990 474 747
Form factor	Palm-size	Palm-size	Hand-held	Palm-size	Palm-size
Size (HxWxD) in mm	131.2x82.5x20	1.3x79x12	170x90x24	127x79x17	130 x 78 x 16
CPU and speed	131 MIPS R4000	70 MHz	ARM 710 running @ 36MHz	20MHz DragonBall	Hitachi SH3 running at 133MHz
RAM/ROM	32/16	16/16	16/12	8/8	16/16
Operating system	Pocket PC OS	Pocket PC OS	EPOC	Palm OS 3.1	Pocket PC OS
Claimed battery life	6 hours	14 hours	One month	One month	8 hours
Batteries	Lithium-Ion	Lithium-Ion	Lithium-Ion	Lithium-Ion	2 AAA
Input method	Stylus	Stylus	Stylus and keyboard	Stylus	Stylus
Dictaphone?	Yes	Yes	Yes	No	Yes
Modem?	No	No	Yes	No	No
Display type	Backlit TFT	Backlit STN	Backlit LCD	Backlit LCD	Backlit LCD
Display resolution	240x320	240x320	640x240	160x160	240x320
Colour or monochrome?	Colour	Monochrome	Monochrome	Monochrome	Colour
Infra-red port?	Yes	Yes	Yes	Yes	Yes
CompactFlash?	Yes	Yes	Yes	Yes (SpringBoard)	Yes
Type II port?	No	No	No	No	No
Methods of PC connection	Serial-based docking station	Serial-based docking station	Serial cable	USB docking cradle	USB docking cradle
Weight (grammes)	255	140	354	153	260

PDA PLATFORMS

## Licensing operating systems

*Creating a PDA OS takes time, expert knowledge and money. Is there an alternative?*

**C**reating a PDA operating system from scratch is a difficult thing to do. If you know lots about building computer hardware and don't want the hassle, a better idea is to license an existing platform. This means that you are given permission to use a software system that is already proven, and you can develop your product in a shorter time. This often means that you'll see profits from your product quicker but, of course, you'll have to pay a fee.

On the other hand, a major benefit to licensing your computing platform out is that the number of compatible machines in circulation will increase. More and more developers write programs, knowing they'll receive money on every item that uses your OS. One of the best examples of licensing is Microsoft's WinCE. Although Microsoft creates

hardware in the form of mice and game controllers, it is better known for its operating systems and productivity titles.

Thanks to the power of marketing, a lot of companies jumped on the WinCE bandwagon when it started off and so devices were launched in both form factors, palm-size and hand-held. The trouble is that WinCE is power-hungry and unstable so, after poor sales, many manufacturers such as Philips, Everex and LG left the fold. It still is quite popular in Europe and the US but it's a far cry from the force that Microsoft claimed it would be. The latest generation of WinCE, Pocket PC, has been taken up by Hewlett-Packard, Compaq and Casio.

Palm, which is part of 3Com, has become so synonymous with mobile computers that people often use the term to describe all small PDAs.

Palm-based systems have several strengths: They're relatively cheap, have great battery life and they are simple to use. Companies such as Handspring and Symbol are Palm OS licensees.

The EPOC operating system is licensed out by the Symbian group, which includes notable companies such as British company, Psion, who are founding members, Nokia, Ericsson and Sony. EPOC devices are known for their great versatility plus a powerful suite of built-in productivity and calendar software. Psion is the main manufacturer of EPOC devices, but you'll also find others from Ericsson and Oregon Scientific. Symbian has a bright future and is very closely linked to mobile telephony. This should give it a notable advantage when its next generation of PDAs is released.



Hewlett-Packard	Palm	Palm	Psion	Psion	Psion
Jornada 690	IIIc	Vx	Revo	Series 5mx	Series 7
£645	£350	£300	£300	£430	£700
£549	£298	£255	£255	£366	£596
0990 474 747	2073 659 820	2073 659 820	0870 1010 500	0870 1010 500	0870 1010 500
Hand-held	Palm-size	Palm-size	Hand-held	Hand-held	Hand-held
189 x 95 x 34	127x79x17	115x80x10	157x79x18	170x90x23	235x182x37
133MHz Hitachi SH3	20MHz DragonBall	20MHz DragonBall	ARM 710 running @ 36MHz	ARM 710 running @ 36MHz	StrongARM SA1100 133Mhz
32/16	8/2	8/2	8/8	16/10	16/12
WinCE 2.11	Palm OS 3.5	Palm OS 3.5	EPOC	EPOC	EPOC
8 Hours	Two weeks	One month	14 hours	One month	8.5 hours
Lithium-Ion	Lithium-Ion	Lithium-Ion	Lithium-Ion	2 AA	2 AA
Stylus and keyboard	Stylus	Stylus	Stylus and keyboard	Stylus and keyboard	Stylus and keyboard
Yes	No	No	No	Yes	No
Yes	No	No	No	No	No
Backlit CSTN	Backlit LCD	Backlit LCD	Backlit LCD	Backlit LCD	STN
640x240	160x160	160x160	480x160	640x240	VGA 640x480
Colour	Colour	Monochrome	Monochrome	Monochrome	Colour
Yes	Yes	Yes	Yes	Yes	Yes
Yes	No	No	No	Yes	Yes
Yes	No	No	No	No	Yes
Serial-based and docking station	Serial-based cable	Serial- based cable	Serial-based docking station	Serial cable	Serial cable, optional docking station
510	192	114	200	354	1,150

## THE SWEETEST SUITE

## MS Pocket Office versus EPOC Office

*How do the two office suites compare?*

**M**icrosoft and Symbian have integrated Office-type productivity suites into the operating system of their respectively licensed PDAs. These programs are built into the device's permanent memory or ROM so the software can't be upgraded unless the ROM can be flashed or an upgrade ROM is installed. Remarkably, these programs have enough functionality to enable you to write letters, search databases or produce complex spreadsheets on the go.

Microsoft has the world's most popular desktop suite. The PocketOffice applications are all modelled on its desktop equivalents so the word processor is called PocketWord, the spreadsheet is christened PocketExcel and the database is called PocketAccess.

EPOC users get a suite that includes a standard database (Data), but there is also a word

processor (Word) and a spreadsheet (Sheet) as well. The database is simple but very versatile. It acts as a basis for the EPOC address book software also known as Contacts plus the Jotter, EPOC's note-taking program.

So which PDA office suite one is the best? Compared to PocketWord, Word (surely there's some sort of copyright issue here) on the EPOC machines is a revelation. Features such as a better spell checker than PocketWord and a built-in word counter help increase productivity. Word, like the rest of the EPOC office suit, has the ability to add in objects from other EPOC programs such as drawing and tables. This makes for much better looking documents and it raises the versatility of programs.

Microsoft counters this with PocketAccess. This program has SQL facilities that you won't find in

Data so, although it's not as versatile (you can't use it as the basis for other programs nor can you add in other objects), it wins here. PocketExcel is a much better attempt at producing a feature-packed miniature program than PocketWord and so these two spreadsheets match each other when viewed feature-for-feature.

If pushed to make a decision, we would chose the easier to use EPOC office package. We admit that the database can't live up to the advanced features on PocketAccess, but it is not available on every licensed Microsoft machine whereas Data is standard on every EPOC device. Word is much better than PocketWord and Sheet compares very well to the similar PocketExcel. These factors mean that it just gets our vote.



# PC Plus Verdict

*Which hand-helds and palm-size PDAs do we recommend?*

## Best hand-held PDAs

### BEST PERFORMANCE

## PSION SERIES 7

■ PRICE £700 ■ EX VAT £596 ■ SUPPLIER Psion ■ PHONE 0870 1010 500 ■ WWW www.psim.com

**P**art of the success of Psion must be credited to the EPOC operating system. EPOC32 is a model of efficiency in terms of processing and memory use, something that can't be said about its rival, WinCE.

All of this expertise has been used to good effect in the Series 7. If you have an old laptop and you're thinking of getting a new one, have a look at what this clever machine offers.



There's an impressive suite of office programs that closely match Microsoft's desktop equivalents. What is more, you also get a great 7.7-inch colour screen, a hinge so you can angle the screen to whatever position you want, a useful keyboard and great scheduling software built-in. Add to this, its great expandability plus long battery life and you have a worthy winner.

### BEST VALUE

## ERICSSON MC218

■ PRICE £430 ■ EX VAT £366 ■ SUPPLIER Ericsson ■ PHONE 08705 237237 ■ WWW www.ericsson.co.uk

**C**hoosing our value for money hand-held PDA was an easy task. We had to give it to the Ericsson MC218, which could be billed the ultimate communication package in portable computing, especially if you already have a Ericsson mobile phone. The MC218 builds on the strengths of the popular Psion Series 5mx – its small size, excellent keyboard and powerful yet easy-to-use operating system.

This device shares a great-looking design, a feature-packed calendar program plus a great suite of office programs. Not only do you get a nifty case, a WAP browser plus a special phone program, you also get an infra-red modem suitable for most Ericssons. What makes this Ericsson special is that you can get it for the same price – or cheaper – than its Psion twin. This makes it a clear winner.



## Best palm-size PDAs

### BEST PERFORMANCE

## HP JORNADA 545

■ PRICE £645 ■ EX VAT £549 ■ SUPPLIER Hewlett-Packard ■ PHONE 0990 474 747 ■ WWW www.hp.com

**I**f you want a powerful PDA on the move then you're best going for a Pocket PC machine. Devices that use the Palm operating system are simple to use but, in general, they lack the storage capacity and processing muscle needed for heavy-duty tasks such as playing MP3 files and surfing the Internet. WinCE was designed from the start to do tasks like these but the trouble was that it linked too closely to the Windows metaphor.

Devices such as the HP Jornada 545 have changed all that. It's not as user-friendly as the Handspring and Palm devices but it gets simple enough with practice. HP makes things easy with its HP Home button that can contain all your favourite programs. This model also sports good looks and plenty of processing power.



### BEST VALUE

## HANDSPRING VISOR DELUXE

■ PRICE £200 ■ EX VAT £169 ■ SUPPLIER Handspring UK ■ PHONE 0207 3090 134 ■ WWW www.handspring.com

**T**he Handspring Visor Deluxe wins this award for many reasons. Not only does it look good with a nicely designed two-toned case, it has good brains.

These come in the form of a fast Motorola Dragonball processor and 8MB of RAM. This memory can be used to store loads of useful addresses and notes, not forgetting all those third party Palm applications that the Handspring is compatible with.

As the Handspring uses the already popular Palm operating system, it's a doddle to use. Additionally, it has a great display and your battery will last a long time. What is more, you can hook it up to your computer using a USB-equipped docking station and how can we forget the unique Springboard module? It's also much cheaper than the nearest Palm, making a clear winner.



## ANALYSIS

## Windows-powered Pocket PC

*Is Microsoft's new PDA operating system any good?*

**W**ith the metamorphosis of WinCE into the Pocket PC operating system, Microsoft has tried to answer criticisms that WinCE wasn't the easiest PDA platform to use, despite being based on the same graphical interface as Win95/98/NT 4.0.

Many of the problems stemmed from trying to model the Windows operating system too closely, without taking into consideration the different

needs of someone who is on the move. Early versions of WinCE have the unfortunate problem of being highly unstable and resource-hungry, so you'll need a very fast processor and loads of memory. In a world where a Palm machine only needs 8MB and a Psion will do wonders with 16MB, this just isn't good enough.

Pocket PC has been a long time coming but, if you're a regular WinCE user, you'll be wondering

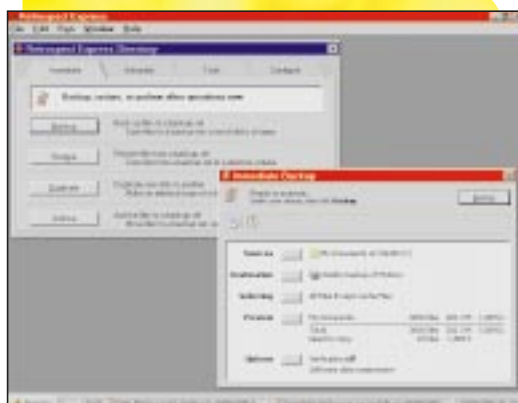
what all the fuss has been about. There isn't much change apart from the interface and the PocketOffice suite of Word, Excel, Access and Outlook haven't really changed. All we can say is that a great opportunity has been missed and that Pocket PC may feel very dated when newer, substantial different looking versions of EPOC and the Palm operating systems come out at the end of the year.





## PC Plus

The tabbed dialog on the left is Retrospect's control centre, and the one on the right is what you get when you initiate a backup.



## backup software

# COMPUTERS UNLIMITED

## DANTZ RETROSPECT EXPRESS BACKUP

*A powerful, low-cost backup program undersold by its user interface*

**Minimum requirements** Win95/98/NT4

Workstation/2000 Pro, 32MB RAM, supported backup device **Tested on** Celeron 366, 128MB RAM, Win98 SE, Iomega Zip drive **Extra information** Trial version available from [www.betterbackup.com](http://www.betterbackup.com)

PRICE £46 EX VAT £39 SUPPLIER Computers Unlimited PHONE 020 8358 5857 WWW [www.unlimited.com](http://www.unlimited.com)

**A**h, the special thrill of bungee jumping on frayed elastic. Exciting, but would you do it without a safety net? Many PC users really do live that dangerously, trusting the safekeeping of valuable work to computers whose reliability approaches that of a house of cards. Sooner or later the winds of ill fortune bring them tumbling down, and months of data go for a burton.

Regularly taking safe copies of important files is fundamental to PC ownership. The backup program bundled with Windows is okay for basic protection, but it isn't the last word in safety and convenience when you move away from simpler scenarios. That's why there are third-party alternatives such as Retrospect Express.

This low-cost version of Retrospect Desktop (reviewed in February's issue *PC Plus*) is intended for disks attached to one machine, and supports fewer backup devices. Express concentrates on removable media such as SuperDisk, CD writers, DVD-RAM, MO, Zip and Jaz drives, and entry-level tape.

### Getting to grips with the interface

First impressions really colour your view of a product. We found Retrospect's user interface took some getting used to. The overall structure isn't bad, but up close it can be confusing and inconsistent. For example, you don't always get Cancel/Close/OK buttons. To proceed you must click [X] on the upper right. Okay, that button is part of the Windows interface, but inexperienced users tend not to have it at their fingertips.

To delete an item from a list, sometimes there's a Remove button, sometimes you have to right-click and select Delete from a context menu, and sometimes right-clicking in a similar-looking dialog does nothing. And why call it a 'sub-volume' when you mean a disk folder? We could go on. Retrospect has a fine pedigree on the Apple Macintosh, but we feel that the backroom boys at Dantz aren't fully up to speed on what a friendly modern Windows application looks like.

Fortunately, persevering with the interface does bring out redeeming features. As is usual with

backup managers, you define one or more collections of files as distinct backup jobs which can be started manually or from an automated schedule.

Once a full copy has been taken, subsequent backups only store files that have changed. With Retrospect, these updates are added to the original backup file, so everything needed is in one place should you have to do a blanket restoration. Alternatively, you can restore individual files and pick the latest version or an earlier one. You would want to do this if you found you had been saving a corrupt file and needed to backtrack to an earlier good copy.

Scheduled backups can run unattended, provided the required media is left in the drive of course. After you set a schedule, the program converts it into a plain-English script of projected actions which can be viewed and modified. Building a selection of scripts enables you to weave multiple schedules, jobs and destination sets of disks or tapes into a comprehensive backup regime.

Retrospect supports media rotation which means, for instance, that daily backups could go to five different media sets, each dedicated to that day of the week. The rotation would build five parallel backups. If one is lost or damaged you have others to turn to. Keeping yesterday's backup off-site covers you against almost everything up to asteroid collision, assuming that most important quality of all in a backup manager – reliability.

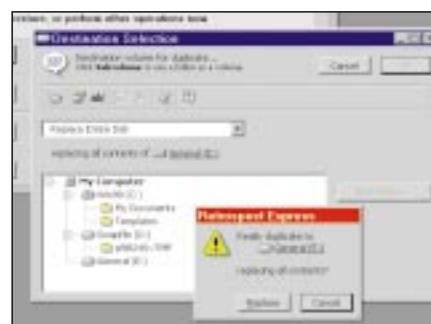
The program didn't fall over in our tests, apart from a problem which Dantz itself alerted us to concerning restoring the registry, and which should be fixed by the time you read this. Snooping around the newsgroups revealed Dantz to be quite responsive to problems, and nothing consistent to cause alarm.

All this flexibility enables precise tailoring of backup regimes to suit your circumstances. You can accomplish almost any backup system with almost any backup program if you try hard enough, but once you've set it up in Retrospect you don't have to think about the mechanics – just follow the prompts.

At a functional level the program has yet more



When a schedule has been set up Retrospect creates a script, as shown here. This can easily be modified.



Automatic unattended backups ensure minimum disruption to your work.

to offer, benefiting from Dantz's work on its upmarket products. The capable backup engine is made less attractive by frumpy bodywork, however. A lift would make Retrospect Express a strong budget contender.

Ian Sharpe

## PC Plus

## VERDICT

### DANTZ RETROSPECT EXPRESS BACKUP

For Essentially a sound and flexible product

Against User interface really needs some massaging

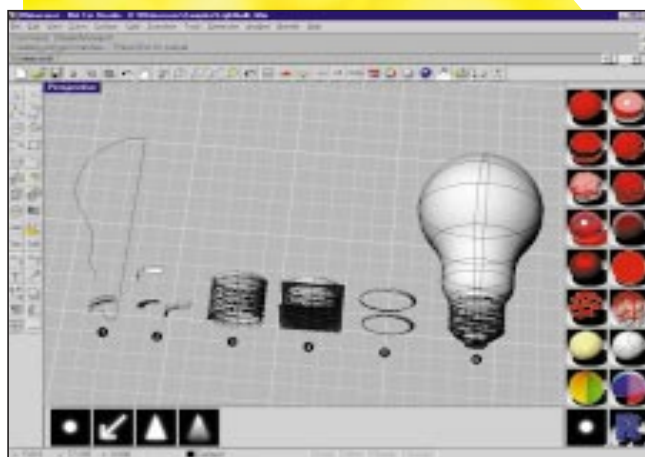
Range of features.....	9
Ease of use.....	6
Documentation.....	6
Performance.....	8
Value for money.....	8

7/10



## PC Plus

Rhino supports BMRT from within the interface. Here you can see BMRT materials and lights in docked palettes. Clicking the big R button will render the scene using BMRT render application if you have it installed.



## graphics software

## RHINO 1.1

*Heavyweight NURB modelling with the latest version of Rhino*

**Minimum requirements** Pentium with 32MB RAM, Win95/98/NT 4.0  
**Tested on** Pentium II 233 with 128MB RAM, NT 4.0

PRICE £586 EX VAT £499 SUPPLIER Softcover International PHONE 020 7259 2100 WWW www.rhino3d.com

**R**hinoceros, to give it its full name, is a NURBS modeller from Robert McNeel & Associates. In its development, the company took an open attitude, with a beta version available for download from its Web site way before the final version was released. This was an astute business move to ensure that as many potential customers could use, and get hooked on, Rhino as quickly and easily as possible. Thankfully, the final product was reasonably priced and was, indeed, one of the most capable NURBS modellers available and unquestionably the best at its price.

NURBS modellers are commonplace but a good NURBS-based modelling package is still hard to come by. Many of the features available in Rhino can be found in high-end packages such as Maya, but you'll pay high-end prices, too.

Although Rhino has an excellent set of surface tools, it can also deal with solids. A raft of solid primitives are on offer, as well as the usual set of

Boolean tools and bevels. They both work as expected and are robust enough to be relied upon, even in difficult situations. In fact, the whole program exudes all the robustness and stability that its moniker suggests.

The Rhino environment has been well thought out and feels suitably ergonomic, even if it is a little utilitarian, but if a modelling application can't look utilitarian what can? New to version 1.1 is a smooth shaded display OpenGL preview, though you can also test render to the viewpoints.

Rhino is primarily a modelling application but you can also produce good quality renders to aid visualisation. Shadows, textures and transparency are supported.

Robert McNeel & Associates has added some significant new features to Rhino that make it a package you shouldn't ignore. Not that the first version was forgettable, on the contrary, but there are some impressive features that can't be matched at any price.

The first is Gazelle. This is an optimisation feature that enables you to be much sloppier in your curve construction because it guesses what you intend to do, sorts out the curves and creates the surface. A good example of this is with curves networks which usually require curves to have endpoints snapped together to function properly. With Gazelle, the curves need only vaguely cross, and they don't even need to be that close. Though you can create surfaces with wild abandon, the more accurate you are, the more accurate the resulting surface will be. Curves networks can consist of mixtures of open and closed curves, though in each direction they must still all be either open or closed.

The biggest single omission to Rhino is any form of relational modelling. Relational modelling, otherwise known as a construction history, is a feature that many good quality NURBS modellers have and which makes modelling a much more organic and fluid process. With relational modelling, the original curves that were used to create a surface still have influence over it. If you have a lathed object you can alter the profile curve

and change the shape of the derived surface automatically. Further, if you trim the lathed surface, even if you go back and edit the lathed curve, the surface and trim will respond to the change. The same goes to extracted curves, fillets and blends and even, if the program is written well, polygon conversions.

Having said that, you do get previews of most operations which enables you to set the best options before you commit.

Rhino is an excellent choice for more CAD-oriented work, industrial design and product visualisation. There is support for most major 3D formats as well as ACIS and STL. A suite of surface evaluation tools, mass, volume and surface area statistics, and dimensioning and labelling finish things off. Renderman RIB files can be written and Rhino 1.1 now supports the shareware renderer, BMRT, for more advanced rendering such as Radiosity.

Rhino is a capable NURBS modeller with just about all the tools you are likely to need.

**Simon Danaher**



OpenGL is supported, though it isn't a necessity. Shading options include wireframe on shaded as seen here.

## NURBS AND SPLINES

## From ship to shore

*Why a ship building term is used in graphic packages*

**N**URBS are mathematical descriptions of curves used in 3D programs to define 2D and 3D shapes. The acronym stands for Non-Uniform Rational B-Splines, spline being another name for a curve. The word spline actually comes from the shipbuilding industry where long strips of wood called splines were used to help shape the curves of boat hulls. By placing weights at particular points along the spline, builders could alter the shape of the smooth continuous curved lines that splines produced. The term 'weights' is also still applied in 3D graphics and refers to a value of a curve or surface's control point that varies its influence over the curve at that point. Weighting points enables you to have fine control over a surface without having to add extra geometry.

## PC Plus

## VERDICT

## RHINO 1.1

**For** Massive suite of NURBS-based creation and editing tools, Gazelle technology, excellent snapping and constraints

**Against** No relational modelling

Range of features.....9

Ease of use.....7

Documentation.....7

Performance.....8

Value for money.....8

**8/10**



# GIMPEL SOFTWARE PC-LINT FOR C/C++ 7.5

compiler

Reduce your debugging time

Minimum requirements 16MB RAM, Win95/98/2000NT 4.0 or DOS Tested on Pentium 500 with 256MB RAM, Win2000  
Available on CD-ROM Publisher Gimpel Software, [www.gimpel.com](http://www.gimpel.com) Additional information Upgrade from version 7.0 costs £76

PRICE £128 EX VAT £109 SUPPLIER Grey Matter Limited PHONE 01364 654100 WWW [www.greymatter.co.uk](http://www.greymatter.co.uk)

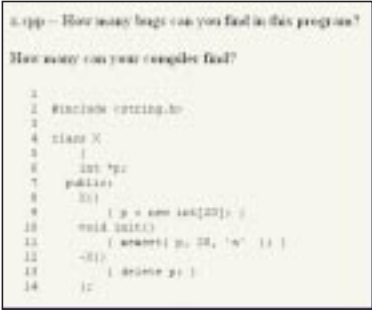
As many of you may know, Borland has made its latest C/C++ compiler available as a free download. This compiler was featured on the SuperDisc a couple of months back, but if you missed it, you can still get the compiler from the official download site at [www.borland.com/bcppbuilder/freecompiler/cppc55steps.html](http://www.borland.com/bcppbuilder/freecompiler/cppc55steps.html). This is the very same compiler that's at the heart of Borland C++ Builder 5.0, so it should be obvious that this is a serious development tool.

Although a modern C/C++ compiler such as the Borland offering will protect you from many programming errors, it obviously can't protect against everything. Moreover, those who are using the free command-line tools haven't got access to the fancy integrated debugger that comes with the C++ Builder IDE. For this reason, you might want to take a look at PC-lint from Gimpel Software. PC-lint, which has been continually upgraded and improved over many years is so named because it enables you to remove the 'fluff' from your C/C++ programs!

PC-lint is a command-line tool which rigorously analyses your C/C++ source file in order to identify and warn of any programming misdemeanours that are likely to cause problems. C++ is a complex programming language and PC-lint includes over 700 different error messages and warnings to help you remove potential problems before even running your source code. Potential problems include excessive shift values, suspicious casting, unreachable code, unused variables and functions, non-portable assumptions about the order of parameter evaluation, loss of sign and so on.

A large number of command-line options can be used to fine tune the behaviour of PC-lint and the utility has built-in support for Microsoft, Borland and other major name compilers. Many software companies run their code through PC-lint before it gets anywhere near the compiler, and find that they get a huge cost saving because subsequent time spent debugging code is greatly reduced.

Dave Jewell



Think you've found all the bugs in your C/C++ code? Run it through PC-lint and you might be in for some surprises...

## PC Plus

### VERDICT

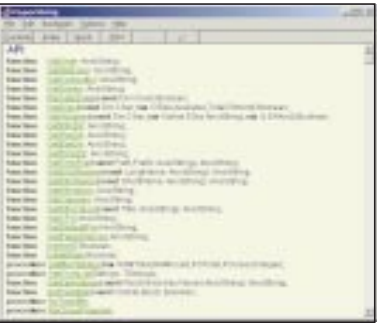
#### GIMPEL SOFTWARE PC-LINT FOR C/C++ 7.5

For Once your code's got a clean bill of health, subsequent debugging time will be greatly reduced

Against How about a Pascal version for us Delphi devotees?

Range of features.....	9
Ease of use.....	7
Documentation.....	7
Performance.....	8
Value for money.....	8

8/10



# EFD SYSTEMS HYPERSTRING 5.4

component software

A huge number of strings and free, too

Minimum requirements 16MB RAM, Win95/98/2000NT 4.0 Tested on Pentium 500 with 256MB RAM, Win2000 Available on Web download Publisher EFD Systems, [www.mindspring.com/~efd/index.html](http://www.mindspring.com/~efd/index.html) Additional information A commercial license costs \$59 (about £37) and includes full source code

PRICE Free for non-commercial use SUPPLIER EFD Systems WWW [www.mindspring.com/~efd/hyperstr.htm](http://www.mindspring.com/~efd/hyperstr.htm)

The HyperString library contains a large number of powerful routines, but is slightly let down by the poorly implemented documentation.

## PC Plus

### VERDICT

#### EFD SYSTEMS HYPERSTRING 5.4

For A huge number of high-performance routines for string and API manipulation at a bargain

Against Help file would benefit from a more functional categorisation

Range of features.....	8
Ease of use.....	7
Documentation.....	6
Performance.....	9
Value for money.....	8

8/10

Reviewing a non-visual library of string routines might seem, well, somewhat boring in today's world of GUI interfaces and RAD development. However, over the years, many serious developers have come to rely on the extended set of string routines offered by HyperString. In the words of Nick Bradbury, creator of the well-known HomeSite HTML editor: "Just wanted to let you know that I've now re-written a substantial number of HomeSite's string manipulation routines using HyperString, and the resulting performance boost is simply incredible." High praise indeed.

So what exactly is HyperString? Well, it's a library of callable routines, compatible with Delphi 3, 4 and 5. If you buy the source code, you'll be able to recompile the various routines for use under C++ Builder as well. A huge number of routines are provided here and, for the sake of convenience, they've been split up into various categories. The API category, for example, includes functions to return the current

Windows directory name, the current user, default printer, list of available COM ports and so on. Nothing earth-shattering, but it's great to have all this stuff ready written for you rather than endlessly reinventing the wheel.

More significant are routines for data compression/decompression, hashing, searching, serial comms and so on. As you'd expect in a string library, there are multitudinous routines to chop, blend, dice and grind strings in various ways. Thus, you'll find a routine for counting occurrences of a specific char in a string, a function for converting textual phone numbers into their numeric equivalents and a whole lot more. If you do any work with strings in Delphi, we recommend that you download HyperString and see what's on offer.

To keep download size down, there's no fancy install program, but detailed instructions are included, and there's a comprehensive help file which integrates into the Delphi/C++ Builder IDE.

Dave Jewell



## PC Plus



The CapShare 920 represents hand-held scanning brought up to date.

# HEWLETT-PACKARD

## CAPSHARE 920

portable

*A hand-held scanner for data capture on the move*

Minimum requirements Pentium with 16MB RAM, Win95/98/NT 4.0 Tested on Celeron 333 with 24MB RAM, Win98

PRICE £434 EX VAT £369 SUPPLIER HP PHONE 0990 474 747 WWW www.hp.com

## PC Plus

## VERDICT

### HEWLETT-PACKARD CAPSHARE 920

**For** True go anywhere scanning.

**Very easy to set up and use**

**Against** A bit pricey

Range of features.....8

Ease of use.....10

Documentation.....9

Performance.....7

Value for money.....6

8/10

**H**and-held scanners tend to have a poor reputation. Today there are very few on the market but ten years ago they were sold to budget-conscious home users at a time when flatbed scanners were expensive. Needless to say, the performance was far inferior to that of flatbeds so news of Hewlett-Packard's hand-held scanner left us sceptical. As we soon discovered, though, the CapShare 920 is a world apart from those entry-level scanners of the early 1990s.

For a start the rationale is different. Going hand-held isn't to achieve a cost reduction but to make the unit portable. Lugging a flatbed around is really out of the question but this scanner will fit in a jacket pocket. But what makes it a truly go-anywhere scanner is that it will capture documents without being attached to a PC. The CapShare 920 scans autonomously and can store between 10 and 50 A4 pages in its internal memory, depending on the type of document and hence the scan mode. And once you've captured a page – at an unspecified

resolution in 256 shades of grey – you can view it on the unit's LCD panel, zooming and panning as necessary, you can rotate pages, you can delete pages, or you can send them to a device with a serial or an infra-red port. In addition to providing support for the PC and the Psion Series 5 electronic organiser, captured data can be sent to an infra-red enabled printer or to a Nokia Communicator.

The CapShare 920 is only about half the width of an A4 page so most documents have to be scanned in strips up and down. However, as long as you leave a small overlap between strips, the unit automatically stitches the strips together to re-assemble the complete document. Documents will even be straightened up if you aren't too careful about aligning the scanner with the edge of the page. Nearly all the drawbacks formerly associated with hand-held scanners have been addressed making this an impressive product. The only drawback is the price, but you're paying for the convenience it offers.

**Mike Bedford**

# SCOTTY

## FOR PSION SERIES 5

utility

*A solar charger for your Series 5mx – a fair-weather friend*

Minimum requirements Psion Series 5mx Tested on Psion Series 5mx

PRICE £50 EX VAT £43 SUPPLIER Widget UK Ltd PHONE Wi WWW www.widget.co.uk

**I**t's one of the unwritten rules of any technology that relies on batteries: they will fail when you need them most. The Series 5mx doesn't come with a mains power adapter. If you haven't bought one as an add on, or if you have one but don't have access to landline power, you have to stop work until you get some new batteries.

With this in mind, most Series 5mx users are fastidious about carrying spare batteries, particularly when on foreign trips. Scotty aims to put an end to this situation by providing solar power for your Series 5mx, and doubling up as a battery charger for NiMH and NiCd cells.

Scotty itself is relatively small – around half the size of a Series 5mx. Its entire front is covered with solar cells, while the back portion has a pop-out stand you can use to prop it up, and compartments for the rechargeable batteries. Scotty connects to your hand-held via a wired link that plugs into its mains

power socket. Scotty, incidentally, claims to operate with a range of other devices, including the Palm V, and some mobile phones via dedicated cables purchased separately.

Our results with the unit on test were mixed. We were able to charge a pair of NiMH batteries, though the process took several days rather than the few hours a normal charger needs. But we were unable to get Scotty to run our Series 5mx.

On the days that we tested the Series 5mx power results it was rather dull, which may account for the problem. Unfortunately, your need for the device is not likely to be weather-dependent, and so this makes Scotty rather less useful than it should be. If you are left with a Series 5mx without power and a Scotty that won't charge it, the only difference between you and the person without the Scotty is that you are £50 worse off.

**Sandra Vogel**



Scotty claims to provide solar power for your Series 5mx, but don't expect it to work when the sun doesn't shine.

## PC Plus

## VERDICT

### SCOTTY FOR SERIES 5

**For** When the weather is fine, it could be very useful

**Against** Won't work on standard dull UK days

Range of features.....5

Ease of use.....8

Documentation.....7

Performance.....4

Value for money.....4

5/10



PC Plus

data protection

# CENTURIONSOFT STEGANOS SECURITY SUITE

*Data protection utilities with a novel idea – monitor radiation blocked by software*

**C**ombining cryptography with concealment, Steganos Security Suite aims to lock up your data and hide the location of protected information.

Password proliferation is the issue tackled by the Password Management module. To help them remember passwords, people often pick simple, easily guessed ones. Steganos generates hard-to-crack passwords containing random elements and, optionally, numbers and special characters.

These passwords are more difficult to guess or to crack by automated assault. They're also more difficult to remember. But recalling passwords is what Password Management is all about. You put them into a password-protected list along with descriptions. The encrypted list is saved as a conventional file or added to what's called a carrier – typically a BMP or DIB image, or a WAV or VOC sound file.

When placed in a carrier, passwords are encoded as variations to the original data. These should be small enough to be undetectable by the senses. The system worked well in our tests but more image formats should be supported.

To retrieve a password you unlock the list, pick the descriptive entry, then read it on screen, copy it to the clipboard or feed it directly into a Steganos password request dialog. Multiple lists are supported and there are neat touches which make the program straightforward to use.

The idea of embedding encrypted data inside an image or sound file reappears in the Encrypt and Hide module. Like other utilities of this type, Steganos will encrypt and decrypt files but it can also bury the encrypted data inside a carrier. A free decryption program can be distributed to recipients of files protected by Steganos.

Managing a large number of individually encrypted files would be a pain and prone to mistakes, so Steganos Safe creates an encrypted file which behaves like an additional drive where you can store files and folders as normal. When you're finished, you close the safe and the drive letter vanishes from Explorer and drive lists.

The most eye-catching component is Zero Emission Pad, a Notepad-like application said to reduce monitor emissions. Without protection, a scanner can detect signals radiating from the display and reproduce the image. Conventional solutions rely on expensive physical shielding, but ZEP does it by software alone.

We're satisfied this probably isn't snake oil. The patent application for the underlying technology

**Minimum requirements** Pentium or better with 16MB RAM, Windows 95/98 or NT 4.0  
**Tested on** Celeron 366 with 64MB RAM, Win98  
**Extra information** Trial version available from [www.demcom.com](http://www.demcom.com)

■ PRICE £47 ■ EX VAT £40 ■ SUPPLIER POW! Distribution ■ PHONE 01202 716726 ■ WWW [www.pow-dist.co.uk](http://www.pow-dist.co.uk)



When accessing protected data in Steganos, you can press the button to the right of the password field. After entering the password to the Password Management list, you choose the required item.

was made by security specialists at Cambridge University's Computer Lab and is backed by research papers (see 'Soft Tempest' at [www.cl.cam.ac.uk/~rja14/](http://www.cl.cam.ac.uk/~rja14/)).

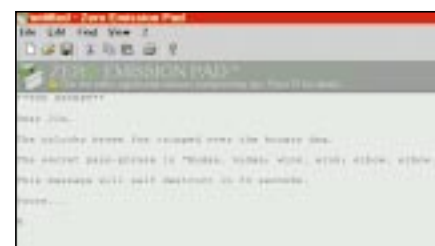
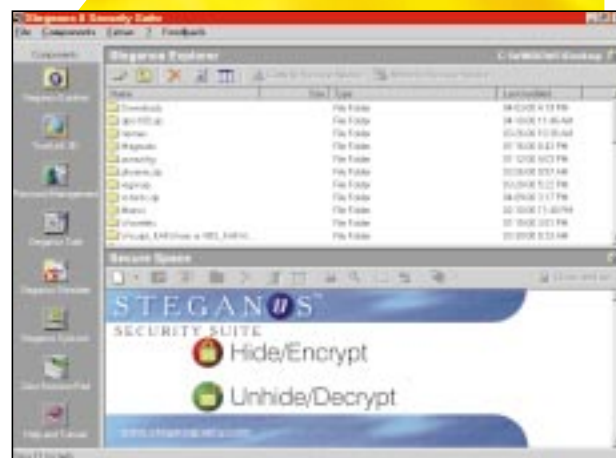
The patent application outlines techniques relating to screen, keyboard and disk drive emissions. ZEP's protection covers the screen alone, relying on a special font. The slightly fuzzy text is not pleasant to view at a stretch, nor is the program particularly usable. Functionality doesn't go much beyond save, load, cut, copy, paste, find and print, and it doesn't even have Notepad's word-wrap feature. More features must be added if ZEP is to have real value.

Next up is Shredder, which destroys the contents of deleted files. This might not happen naturally for some time after a file has been deleted in Windows, making it easy to resurrect dead files unless explicitly destroyed by a utility like this.

'Shredding' is actually secure erasure to the US Government standard. In addition to the data, Shredder is claimed to wipe the file's directory entry, too. We found that although the cluster and size information in the directory is erased, the name, time and date remain.

The gap between documentation and reality is probably not a concern in most real-life cases. We understand it'll be fixed in the next release, but it's always worrying when a security product doesn't do quite what it says on the box.

Modules are neatly grouped in an Outlook-style console. File encryption, hiding and shredding are also available from file context menus.



Any font you like, as long as it's this small fuzzy one, which isn't pleasant to view at a stretch. Zero Emission Pad is a Spartan implementation of what's probably a good idea.

Finally, there is SysLock. At the touch of a hotkey this blanks the screen and password protects a running PC. A casual snooper may be repelled for a few minutes, but additional measures are needed to defend the machine against a more determined attack or network access from an unprotected computer.

Without a doubt Steganos Security Suite is a handy bag of tricks if you need to keep information under wraps. You can find freeware equivalents of several of its utilities, but the convenient ways it integrates with Windows and manages its various functions are a real plus.

Ian Sharpe

PC Plus

## VERDICT

### STEGANOS SECURITY SUITE

For Good and mostly usable range of options for encrypting and hiding data

Against Zero Emission Pad is too basic. Carrier files should support more image formats

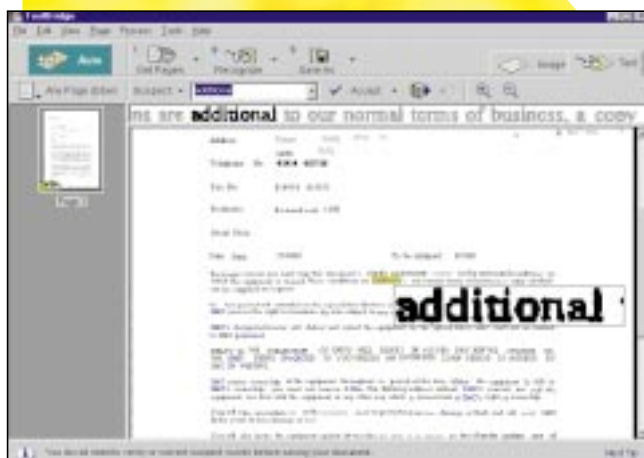
Range of features.....8  
Ease of use.....8  
Documentation.....6  
Performance.....7  
Value for money.....7

7/10



## PC Plus

TextBridge Pro can scan, recognise and save documents automatically, but for badly-degraded originals like faxes you might need to correct/accept dubious words manually.



## OCR software

# SCANSOFT TEXTBRIDGE PRO MILLENNIUM

Quick and accurate OCR software

**Minimum requirements** 486 or better with 24MB RAM, Win95/98/2000 or NT 4.0  
**Tested on** Pentium III 450 with 128MB RAM, Win98

program's struggling to get it right. We found TextBridge managed very well, even with complex, multi-column magazine layouts.

Next, TextBridge will attempt to 'recognise' the text on the page. Here you can leave it to run through automatically, or correct/accept each instance of a 'dubious' word.

Finally, you can save the 'recognised' file – and this is where the Millennium Edition proves a lot more useful than previous packages. You've always been able to recreate a document's original layout in Microsoft Word, or one of a handful of better-known word processor/office applications, but now you can save it as WYSIWYG HTML. TextBridge Pro Millennium uses DHTML and cascading style sheets to reproduce your printed documents as Web pages – complete with 'live', searchable text.

Does this really work? Well, up to a point. The layout and quality of the original document is all-important. TextBridge Pro proved itself capable of recognising even quite badly degraded text in fax documents, and it can do a remarkable job of reconstituting magazine pages and leaflets as HTML. However, 'remarkable' doesn't mean 'perfect'. You're likely to have to help it out with manual zoning and correction to improve the results, and even then they don't always translate well into HTML or Word layouts.

OCR packages are supposed to save you time and effort, so you've got to be careful you don't spend more time trying to perfect your OCR than it saves you in the first place.

Nevertheless, TextBridge Pro is pretty well state-of-the-art for OCR technology, and for those who need to process and archive paper documents, it's swift, accurate and really rather clever.

**Rod Lawton**

PRICE £50 ■ EX VAT £43 ■ SUPPLIER ScanSoft ■ PHONE 0800 0355 355 ■ WWW www.scansoft.com

**T**extBridge Pro is one of the two leading OCR packages on the market, and for some time now has been battling it out with Caere's OmniPage. Both products have now been bought by ScanSoft and for the time being at least they're going to carry on in parallel.

OCR software is extremely useful for those who need to sift through and archive lots of paper-based information. It works via your scanner, 'recognising' printed text, turning it into an editable file. But then most scanners come with an OCR package included in the software bundle, so why should you pay out all over again for a dedicated package like this one?

It boils down to accuracy and versatility. ScanSoft promises TextBridge Pro Millennium offers "99 per cent accuracy", but that figure is essentially meaningless because the accuracy of recognition depends on the quality of your original documents. So we tried it out on a faxed loan contract from a manufacturer, which we sign on a regular basis to secure hardware for review – a

pretty handy kind of document to archive. You might want to scan an interesting newspaper story, for example, or letters you get from the bank manager.

Our scanner's standard OCR software (OmniPage LE) made a bit of a pig's ear of the whole job. It recognised much of the text, but a significant proportion was gibberish, and the results were somewhat less than useful.

TextBridge Pro Millennium, on the other hand, did a remarkably good job. There were very few errors indeed, and we were left with a text file that mirrored the layout of the original, but was much smaller than a scan file and both editable and searchable.

TextBridge Pro proved much more reliable than our scanner's bundled OCR software, then, but there's a lot more to it than that. TextBridge can handle much more complex layouts, coping with columns, boxouts, graphics and tables. It does this using 'zones' – you can either let TextBridge 'zone' documents automatically, or do it yourself if the

## CUT-DOWN VERSION

## Paper Converter

Is it worth paying the full package?

**P**aper Converter is a kind of cut-down version of TextBridge Pro Millennium. It's designed to work within Microsoft FrontPage 2000, and via a couple of buttons on the toolbar you can either add a scanned and recognised document as a complete Web page, or insert the scanned content into an existing page. You can also run Paper Converter as a standalone application, saving 'recognised' documents as WYSIWYG Web pages for inclusion in a FrontPage Web or editing in any other Web editor. Given that Paper Converter is only £10 cheaper than TextBridge Pro Millennium, though, and that TextBridge Pro can itself be launched within FrontPage in the same way, the extra £10 for the full package seems worth paying.



Paper Converter's aimed at what ScanSoft sees as a rapidly-developing market sector, that of Web content generation, sharing and management in corporate Intranets and workgroups.

## PC Plus

## VERDICT

### TEXTBRIDGE PRO MILLENNIUM

**For** Accuracy, HTML layouts, ease of use

**Against** More complicated layouts need some user-intervention

Range of features.....9

Ease of use.....8

Documentation.....8

Performance.....9

Value for money.....7

**8/10**





## PC Plus

Umax's Astra 4000U is a good general purpose scanner, with above average precision on line drawings.



## scanning

# UMAX ASTRA 4000U

*A very workmanlike scanner at a reasonable price – you won't go far wrong with this*

**Minimum requirements** Pentium processor, 32MB memory, USB port, 300MB hard drive space, Win98  
**Tested on** Celeron 550 with 64MB RAM, Win98 SE

PRICE £199 ■ EX VAT £169 ■ SUPPLIER Umax (distributor IMC) ■ PHONE 01344 871329 (IMC) ■ WWW www.imcnet.com

Umax is well known for scanners at all prices and specifications and the Astra 4000U is aimed at the business market for general purpose home or office scans. It's not intended for the professional or pre-press markets, where prices start at around £800 and are still rising when you hit £3,000.

The Astra is quite bulky, in height as well as width and depth, but the hinged lid is stiff enough to stay vertical when you lift it, so you don't have to support it when positioning an original. The orange hinge along the back of the lid adds an attractive style element and there's an optional transparency scanner available from Umax, which comes as a replacement lid. The scanner uses a Charge Coupled Device (CCD) array, which gives better definition than the LED strips, which some budget devices use.

Less endearing is the fluorescent tube, used to illuminate the subject during scanning, which stays on most of the time, including when you're positioning an original. The light is very bright and

makes lining up against the ruler marks embossed around the edge of the flat-bed awkward. Perhaps Umax should bundle a pair of Ray-Bans.

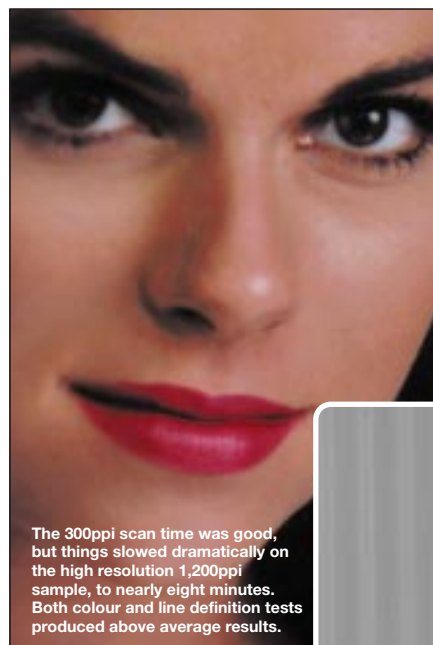
Mid-range flat-bed scanners start at around £200, so the Astra 4000U fits pretty well into that price band. It connects straightforwardly enough using a USB cable to any USB port on your PC. As usual, it's best to install the scanner software first, but with this in place set up is pretty near automatic.

Software starts with Umax's own VistaScan 3.52, a simple but effective TWAIN applet which handles scanning from whichever application you call it. It has two modes, Beginner and Advanced, so you can let the software do everything automatically or choose to set things like resolution and colour depth yourself.

It's easy-to-use in either mode, though would benefit from a larger preview window, so you could see your original in more detail. It's also awkward to set a specific size for a scan, such as 7x5-inch for photographic prints because the marquee edge defining the scan area jumps by 0.04-inch when you release the mouse button.

Impressively, Umax bundles a copy of Adobe's Photoshop 5 LE. This photo editing and make-up software goes a good way towards the full product and is a much better option than PhotoDeluxe for serious work. There's also Presto PageManager for cataloguing your scans and OmniPage LE for OCR work. A good bundle for a medium range scanner.

The results of our tests were good, throughout. The scanner is rated at 1,200x2,400ppi optically and can interpolate above this to 9,600ppi. We



The 300ppi scan time was good, but things slowed dramatically on the high resolution 1,200ppi sample, to nearly eight minutes. Both colour and line definition tests produced above average results.

tested at 300, 600 and 1,200ppi and produced scans that were close to the originals in colour, with only a slight cast into the red on skin tones.

The line test, where the scanner has to resolve closely-spaced pairs of black lines on a white background, also came through well. The results weren't perfect, but were a lot better than from many scanners we've tested.

Overall, Umax's Astra 4000U is a very workmanlike device at a reasonable price. We'd like an option to turn the tube off when not scanning, even if that did mean slightly longer warm up times, but otherwise you won't go far wrong with this flat-bed.

**Simon Williams**

## SPECIFICATIONS

Warranty	2 years on-site
Flat bed size	A4/US Letter
PC connection type	USB
Optical resolution H x V (ppi)	1,200x2,400
Interpolated res H x V (ppi)	9,600x9,600
Colour depth	42-bit
Light source	Fluorescent tube
Sensor type	CCD
Power source	Internal transformer
Dimensions W x D x H (mm)	312x535x120
Scanner utility software	VistaScan 3.52
Image editing software	PhotoShop 5.0
OCR software	OmniPage LE
Image management software	PageManager 4.20

## SCAN TIMES

Preview scan (min:sec)	Full scan(min:sec)
8 x 8 print 300ppi	7x5 print 1,200ppi
0:29	0:28
0:55	7:55

## PC Plus

## VERDICT

## UMAX ASTRA 4000U

**For** Good quality scans. Strong software bundle

**Against** Light in your eyes. Bulky

Range of features.....9

Ease of use.....6

Documentation.....7

Performance.....7

Value for money.....8

**8/10**

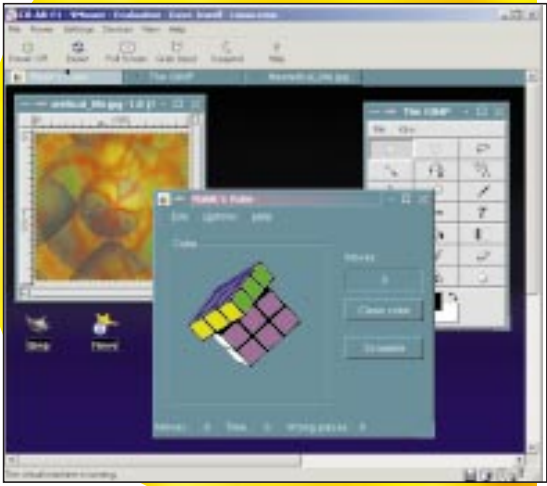


programming utility

# VMWARE 2.0 FOR NT AND WIN2000

Run Linux, Win98 or barefoot DOS inside a WinNT/2000 window

**Minimum requirements** Pentium 266 with 64MB RAM, Windows NT 4.x/2000  
**Tested on** Pentium 500 with 256MB RAM, Win2000  
**Available on** Web download  
**Publisher** VMware Inc [www.vmware.com](http://www.vmware.com)  
**Additional information** A 30-day trial version can be freely downloaded from the VMware Web site (approx. 5.2MB). Prices do vary, check the VMware web site for details



Explore the strange new world of the GIMP, the KDE desktop and (oh alright then) assorted Linux games, all from the comfort of Windows 2000....

PRICE \$299 SUPPLIER VMware Inc PHONE 001 650 475 5000 WWW [www.vmware.com](http://www.vmware.com)

**V**Mware is a fascinating utility that enables you to run several 'virtual machines' at the same time. To a developer who is trying to get his product working across multiple platforms, this sort of functionality is like manna from heaven. Not only can you run Windows 95/98 under Windows 2000, but you can also run a full-blown Linux operating system in a window, too. A programmer who only has access to a single machine can simultaneously test and debug software on each supported platform, without the inconvenience and wasted time involved in continually rebooting the hardware.

operating systems. This is where the fun starts. Initially, you specify that you want a Linux install and give a few other details such as wanted hard disk capacity (remember, this is a virtual hard disk) and RAM size. VMware suggested 48MB of RAM for a Linux install, but we thought this was a bit mean and upped it to 64MB. Then, you just insert the Linux setup CD into your machine and click the Power On button in the VMware window. Amazingly, you see your machine's BIOS go through its power-on self test just as if you were booting a 'real' PC. At this point, the Mandrake CD booted and we went through exactly the same series of Linux setup options

custom server that understands that it's running in a virtual machine and is able to communicate directly with the real display driver. With VMware tools installed and Mandrake Linux rebooted, everything ran much faster, and we had a display resolution equal to that of the host system.

VMware 2.0 is a substantial improvement over its predecessor. There's a deeply cute Suspend to Disk feature which enables you to freeze an active virtual machine and shutdown VMware. Restarting the frozen VM is generally a lot faster than booting a guest operating system from scratch, and you'll find everything just as you left it. Virtual machines can appear on a LAN as a distinct entity in their own right, and there are options for network sharing between the host and guest operating systems.

For developers who want to see what Linux has to offer and who definitely don't want to start repartitioning their hard disk, messing about with the master boot record and so on, VMware is a great choice. Even if Linux isn't an issue, VMware offers a great way of moving to Windows 2000 while still being able to fire up earlier versions of Windows (including Windows 3.1 and barefoot MS-DOS) at the drop of a hat.

Dave Jewell

## VMware offers a great way of moving to Windows 2000 while still being able to fire up earlier versions of Windows at the drop of a hat

We tested VMware 2.0 under Windows 2000, using it to run Mandrake 7.0 Linux. In VM-speak, this means that Windows 2000 was the 'host' operating system, while Mandrake was the 'guest'. A single host can run multiple guests at the same time but, for obvious reasons, memory requirements will go up as you add more. Installation begins with the setting up of VMware 2.0 itself. Just download the self-extracting executable from the VMware Web site and run it. At the same time, you'll need to register on the Web site in order to get an evaluation 'key' which is sent to you via e-mail. Armed with this key, VMware will run for 30 days. The next step is to install one or more guest

that we'd have used when installing Mandrake into a physical disk partition. Everything went smoothly until we got to the point where we needed to specify the type of display adaptor. Not having bothered to read the small print we tried to specify the actual display card we were using, but Mandrake refused to detect it - not surprising as it was running in a virtual machine. The only entry it would accept was Generic VGA, meaning that Mandrake initially booted up in 640x480 pixel mode, with something like 16 available display colours - not a pretty sight. Having read the manual, we then installed the VMware tools from 'virtual floppy'. This replaces the XFree86 X-server with a special

### PC Plus

#### VERDICT

**VMWARE 2.0**  
**For** A terrific utility for running multiple guest operating systems.  
**Does exactly what it says on the tin**  
**Against** Might be nice to see support for BeOS guests?  
Range of features.....8  
Ease of use.....9  
Documentation.....8  
Performance.....10  
Value for money.....8

9/10



# ON-LINE ORGANISERS

*If you're on the move but have access to the Web, an on-line diary can be a life saver. There's a number of sites that will help you do it – the key is synchronising them with your existing calendar software. Be sure to test them yourself before committing your life to them!*

## MY PHONE BOOK

[www.myphonebook.com](http://www.myphonebook.com)

**T**his site acts as a primitive organiser – it pushes the phonebook functionality, while also sneaking in the ability to schedule activities with each of your contacts. When you set up a meeting using the simple Web interface, you can choose to be notified of your schedule up to one day in advance. You can export your contact information to a comma-separated file. The site also claims to enable synchronisation with some popular contact managers such as GoldMine and Act! – unfortunately this feature was unavailable for our test.

You can fully customise the address book, adding custom fields and information. However, there are a few annoyances: The most obvious of which is an inability to name any county with more than two letters – evidently those folks over the pond don't understand us British folk. The site's raw feel would be excusable if it truly integrated with your contact manager but, as it stands, it isn't worth the effort.



If you use Goldmine or Act, check back to see if the syncing works.

**PC Plus** 6/10

## MSN CALENDAR

<http://calendar.msn.com>

**Y**ou need to be a HotMail user to access MSN's on-line calendar, so if you don't have an account you'll need to sign up before you can login. Once you're into the system, Microsoft's investment in good Web designers shows – it's all very sleek and stylish. When you have set up an event, you can invite others to it – you can only do this by e-mail address because there is no built-in contact management facility.

In addition to all of the regular appointment features (recurring appointments, e-mail notification and so on) you can also create Task lists, Reminders (the same as the Task lists but with the dates), and create notes (the same as the Reminders but without the dates). MSN surprised us by not allowing you to integrate the calendar with the popular HTML-enabled Outlook and Outlook Express tools. Perhaps its redeeming feature is the facility to create 'Printer Friendly' versions of all of your pages. These contain all of the information you need, without the fancy page furniture.



Stylish, but lacks integration into Microsoft's desktop apps.

**PC Plus** 8/10

## NETSCAPE CALENDAR

<http://calendar.netscape.com>

**T**he Netscape calendar is a similar offering to the MSN calendar. It requires you to sign up to the Netscape NetCenter portal before you can use it but, once registered, it includes a couple of neat tricks that Microsoft doesn't employ. You can create appointments in your calendar, but again there is no contacts facility, and you can't export to a file. Netscape has teamed up with several third party contact providers to enable you to 'track' events in your calendar. Everything from book launches to family outings are at your fingertips but, again, there is a heavy US bias.

On top of this, you can add weather forecasts for some UK cities, although being told that Bath is 46 degrees Celsius in the middle of May was somewhat surprising! You can also have your horoscope added to your diary if you wish. Netscape's calendar comes out head and shoulders above MSN, thanks to its design and extra functionality.



A classic calendar – but don't believe the weather forecasts.

**PC Plus** 9/10

## THE DAILY DRILL

[www.dailydrill.com](http://www.dailydrill.com)

**O**rganising your life shouldn't be boring. The Daily Drill ensures it isn't. Log in and set up a profile that gives you a daily horoscope, joke-of-the-day, bible quotes, trivia or event listings (for US and Canadian cities only, darn) and choose from a slew of themes.

But the Daily Drill is far from lightweight. The interface is clean, presenting you with day, week, month and year views, plus a unique 'Busy' view, which enables you to view your time in blocks to see how cluttered your week is. As with Netscape Calendar, you can share your dates by creating groups. Set one up and you can allow others to view your calendar; subscribe to other people's to see when they're busy. Best of all are the range of programs you can synchronise your calendar with: Palm and WinCE hand-helds, plus Lotus Organizer and Microsoft Outlook on your desktop – the only cost is a 6MB download. Add an address book and the Daily Drill would be perfect.



Pencil in some humour and synchronise with your hand-held.

**PC Plus** 9/10





office suite

# COREL WORDPERFECT OFFICE 2000

The Microsoft-challenging office suite debuts for Linux

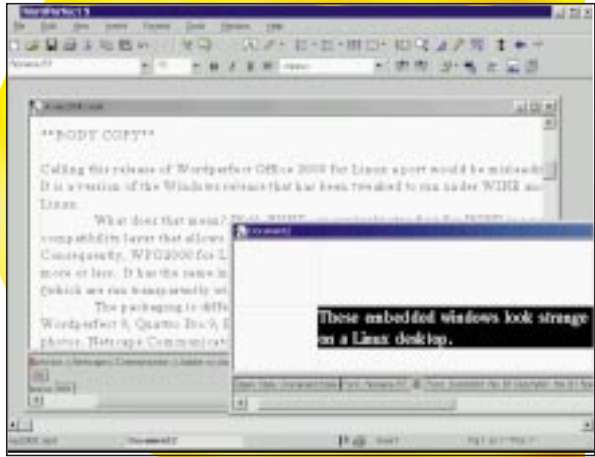
Calling this release of Wordperfect Office 2000 (WPO2000) for Linux a port would be misleading because, strictly, it's not. It is a version of the Windows release tweaked to run under WINE and slickly repackaged for Linux. What does that mean? Well, WINE (it stands for WINE Is Not an Emulator) is a compatibility layer that enables Windows applications to be run at full speed on x86 Unix platforms. Consequently, WPO2000 for Linux is identical to the Windows version because it is, more or less, the Windows version. It has the same interface, the same features, it is even shipped as Windows EXEs and DLLs (run transparently with the WINE launcher).

The packaging is different, though, and better value for money. The Deluxe edition includes Wordperfect 9, Quattro Pro 9, Paradox 9, Presentations 9, CorelCENTRAL and a host of fonts, clipart and photos. Netscape Communicator, Adobe's Acrobat Reader, Corel Linux and a cuddly Tux toy are all thrown in as a bonus.

### The suite

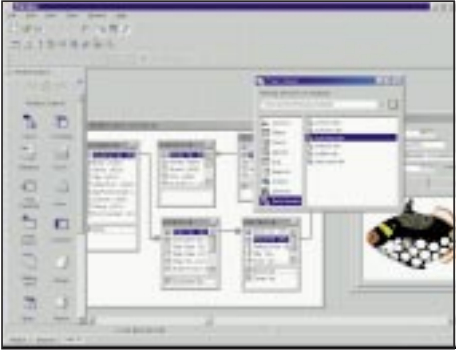
Ignoring any freebies, the most compelling part of WPO2000 to most will be Wordperfect itself. It's a popular word processor, especially with professionals. Version 8 has been out on Linux for some time but, with this release, thankfully, the clunky Motif interface has gone. Also new is RealTime Preview, which enables you to see the

**Requirements** Pentium 166MHz (200MHz recommended), 32MB memory (64MB recommended), 450MB HD space, 2.2 series kernel  
**Tested on** Pentium 350MHz, 64MB, Debian (potato), kernel version 2.2.14



With IceWM's Fake95 theme and WINE's Win95 widgets, you'd be forgiven for thinking this was Windows.

PRICE £153 EX VAT £130 SUPPLIER Corel PHONE 0207 298 8505 WWW www.corel.co.uk



Paradox 9's ease of use belies its power.

effect a style change will have before you apply it, browser-like navigation controls and better font support. X's handling is rather poor, so Corel has bundled a proprietary font server that handles TrueType and Type1 fonts and a set of well designed replacements for the standard Microsoft fonts.

The rest of the suite, although less well known than the competition from Microsoft, has solid applications. Quattro Pro stands up well against Excel, and Presentations 9 can give PowerPoint a run for its money. Paradox 9 is the real bargain, though. This is an ODBC-compliant relational database, which has previously been available only in the Professional edition of WPO2000. The only weak point of it is CorelCENTRAL. This is a functional personal organiser, but many better PIMs are freely available for Linux.

Corel has targeted improvements in WPO2000 on integration and compatibility. It has made the interfaces more coherent and added new import and export filters. These enable you to load and save many types of documents, with particular attention paid to Web formats such as HTML and PDF.

### The sour?

As with Corel's controversial Linux distro, the similarities between WPO2000 on Linux and

Windows will, no doubt, both delight and offend. While Linux enthusiasts might bemoan the dumbing down of its OS, newcomers will find the familiarity a boon. Moreover, IT departments will now be able to deploy a Microsoft-free desktop that will require little retraining.

The price to pay for this is that WPO2000 feels ill-at-ease on an X desktop: The interface elements are alien, particularly the embedded windows and file dialogues, and some widgets still require DOS-style file paths.

Even the on-line help apes the Windows help topics, courtesy of a custom Java applet hosted on Netscape. Integration with the rest of your Linux software is poor, too. Although WINE uses the standard clipboard, you cannot drag-and-drop files between a desktop and WPO2000 or between the suite's components. A final concern is stability: WPO2000 does not behave as reliably as we would expect for this type of software. Hopefully as WINE matures, such issues will disappear.

These criticisms aside, Linux users who just need to get the job done should be able to look beyond the Windows dressing and see that WPO2000 is the most complete and professional office suite available for Linux.

Richard Drummond

### PROBLEM SOLVED

## Getting it on

How to install across the different Linux distributions

A major problem for any commercial vendor of Linux software is producing a simple installation scheme that will work across the many different Linux distributions. Corel's custom graphical installer solves this problem. Simply mount the CD as root, execute the setup program and everything's done automatically.

Alternatively, since the binaries are supplied both as Debian and RedHat packages, you can install manually with your favourite package manager. The installer adds entries to both GNOME and KDE launcher menus, so running is simple, too. You can also start the suite components from the shell by calling a startup script with the appropriate name.

### PC Plus

#### VERDICT

##### COREL WORDPERFECT OFFICE 2000

For Good value for money, familiar interface

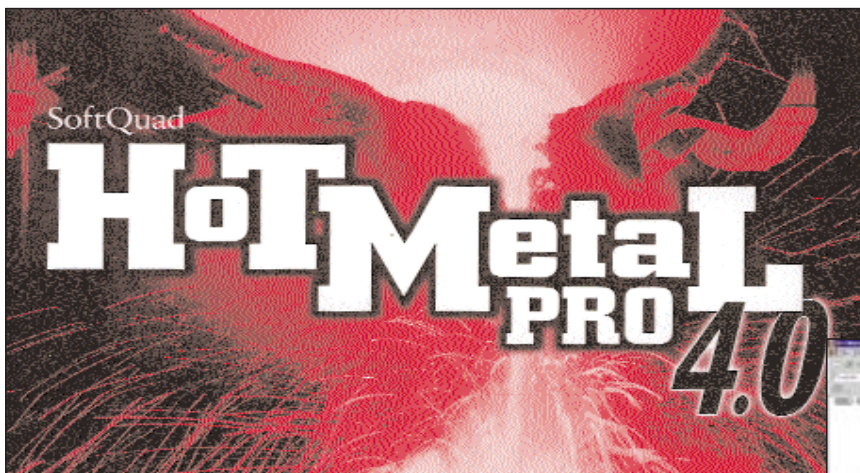
Against Looks too Windows-like, not 100 per cent stable

Range of features.....	8
Ease of use.....	8
Documentation.....	8
Performance.....	6
Value for money.....	8

8/10



# HoTMetaL Pro 4.0



Anthony Hannan  
gets you  
started with  
HoTMetaL Pro 4.0  
from SoftQuad

**H**oTMetaL Pro 4.0 is a convenient and quick way to build Web pages. Unlike other tools, you're never limited with HoTMetaL Pro. If you're creating your first Web site, this program will prove easy-to-use. Updating and editing is similar to any of the leading WP or DTP packages, and templates are provided for a wide range of applications. The program provides three different and powerful editing modes: WYSIWYG (what you see is what you get) for quick page prototyping; HTML source for quick and direct access to your HTML code; and Tags On for the precision of source editing with the convenience of WYSIWYG display. In our opinion, this is the best view for beginners because you get to see exactly what the tags do in HTML. In the *How to create a Company Home Page* walkthrough we show you how to do just that in a few minutes. Power tools are provided to enable you to animate and manipulate images of all kinds. For more experienced users, Arcadiaz Javascript 1.0, a Javascript development tool, is a rare inclusion that lets you add extra power to your pages.

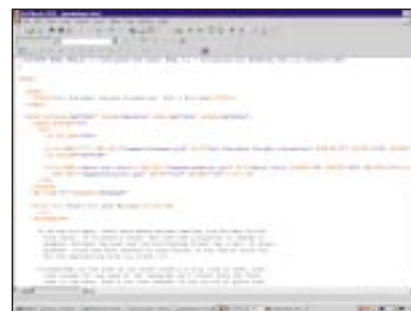
## Using HoTMetaL Pro 4.0

The templates provided make an ideal starting point to have your page up-and-running in next to no time. Products, press releases, customer surveys can be adapted to suit your chosen style by simply editing and saving your own templates. Editing is performed simply by clicking and typing over or inserting text or an object wherever you choose.

Photoimpact enables you to directly import from disk, scanner or camera and supports all popular file formats including BMP, JPG and TIF. With the Link facility, it is possible to link wherever and with whoever you please – an essential



The Tags On view, available in HoTMetaL, proves invaluable to new and experienced Web designers alike.



But for those of you who don't mind getting your hands dirty with HTML code, the editor is nicely set out with lots of handy functions. And if it all gets too much for you, you can just flip back to WYSIWYG.

element in a comprehensive site. Other typical Web page elements are just as easy to add. There is a wide range of supporting tools including a spell checker, a HTML validator, CSS editor and a thesaurus. The comprehensive features mean that this is not just a stepping stone to other packages but one that you will continue to use. All-in-all, HoTMetaL Pro is ideal for beginners and more experienced users alike. The full product is included on this month's *SuperDisc* and users who register their copy of HoTMetaL Pro on-line will also qualify for free technical support.

**Anthony Hannan**

## STAYING IN CONTACT

### Benefit now, while you write your site

**I**f you already have a Web hosting for your page then put up a temporary page saying something like, 'The ABC Homepage will appear here'. To do this, click on Your Companies Contact Page, enter your message and then enter all your current contact details. Liaise with your Hosting Service to make the page live. Once live, you will benefit from people being able to contact you by other means while you perfect the design of your own 'definitive' site.

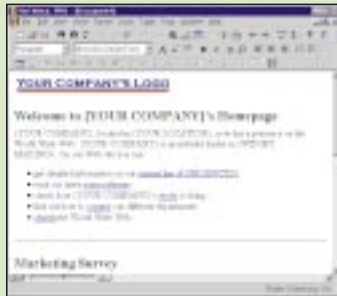
## FULL PRODUCT



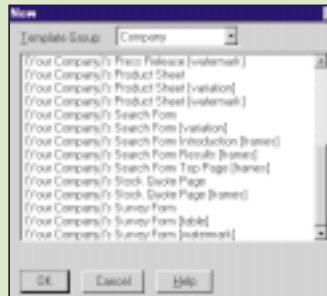
## WALKTHROUGH

# How to create a Company Home Page

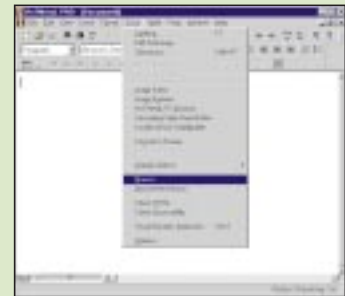
Add flair to your pages with HoTMetal Pro



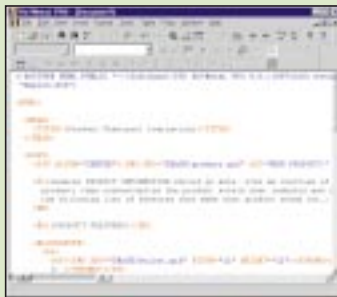
**1** Simply insert your graphic at the top and type over the text. Predefined links are included to enable you to build a whole site from these templates.



**2** This is just a few of the company templates provided with a comprehensive section for personal pages. Click on 'file' and 'new' and then on 'Template view' to see all the options.



**3** A comprehensive bunch of macros are available. To access them, click on 'tools', 'macros' and then 'select'. The selected macro can then be used by pressing the default 'F11' hot key.



**4** It is possible to view the HTML source, just click on 'view' and then 'HTML Source' to view the code for your page. Should you choose to save the file with a different name, with a little careful editing you can slim down your code without risking your original page.



**5** To insert a link into your page, click on 'insert' and then 'link'. You can insert any type of link here. If you regularly use a link then it can be added to the 'Hotlist' favourites in Internet Explorer.



**6** To insert a table into your page, click on 'table' and 'insert table'. You can then customise the table and insert items just as you would in a word processor.

**Exclusive!**

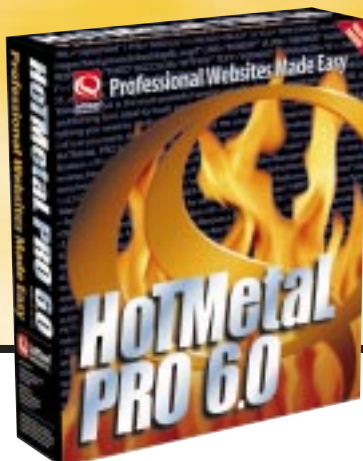
**PC Plus Upgrade Offer**

Upgrade to HoTMetal Pro 6.0 for **only £79 +VAT**

(normal selling price £99 +VAT)

## HotMetal Pro upgrade offer

HoTMetal Pro 6.0 gives you total control over your HTML so you can develop sophisticated Web sites. Its multi-view editing modes make it ideal for the professional editor as well as the less experienced.



HoTMetal Pro 6.0 is packed with new tools and features to help developers working with sites which include the latest Web technologies. It offers full support for CSS, frames, Dynamic HTML, Java, JavaScript, VBScript, Miva, XML, WebTV, ShockWave, Flash, QuickTime, RealAudio, streaming audio and video among others.

There are many other maintenance tools included that perform such tasks as working out page download time and checking your site's links. Other features include advanced asset management, built-in FTP, file synchronisation, site-wide search-and-replace and a set of tools for live editing on-line.

You can order by calling

**020 8387 4110**

Give your order with a credit card. SoftQuad accepts payments by all major credit/debit cards, apart from Amex, Diners and Electron. Delivery is free in the UK, by courier (the delivery address must be where a signature can be obtained and not a PO box number).





# Oxford *Interactive* Encyclopedia



Let **Oxford Interactive Encyclopedia** guide you through a universe of text and multimedia

**O**xford has a history of excellence and is recognised throughout the world as a seat of learning. The Oxford Interactive Encyclopedia brings together, on one CD-ROM, the completely updated text of The Oxford Illustrated Encyclopedia; The Oxford Dictionary of the World, giving details of peoples, countries, regions, cities, natural features and sites of interest; The Pocket Oxford Dictionary of Biography with biographical entries, covering famous men and women, past and present from a wide variety of countries, cultures and periods; The Electronic New Shorter Oxford English Dictionary, Encyclopedia Edition covering all varieties of the English language, both international and dialectal; and The Concise Oxford Thesaurus which contains more than 350,000 synonyms and antonyms and over 400 separate tables showing sets of words related to people, places and things, from actors and animals, to weapons, wonders of the world and the zodiac.

## Getting started

When you open the Oxford Interactive Encyclopedia, you see the Tableau screen, which frames the four main components of the environment: the Article Viewer at the right; the Multimedia Viewer at the top left; the Path Viewer at the bottom left; and the Path Bar that runs down the left-hand edge of the screen.

**Finding information about the most obscure things is easy with the Oxford Interactive Encyclopedia.**

You can, for example, read about the history of Australia in the Article Viewer, watch a video about the Great Barrier Reef in the Multimedia Viewer, and locate Australia on the atlas in the Path Viewer, all at once. These three viewers help you make connections between articles, pictures and other media.

Select Guided Tour in the Menu for an overview of the encyclopedia, and whenever you have a question, just click on the Help button at the bottom of the screen for instant information. To change the default opening screen, go to Preferences from the Menu and click on the box to 'Save my place'.

## The Viewers

In the Article Viewer you will see the text of articles, along with the icons and cross-references that lead to related multimedia and other articles. Click on any purple text to retrieve a related article, and use Backtrack to return to the article you were viewing. To manipulate the article text and the viewer, use the buttons along the bottom of the viewer or go to the viewer menu for more options.

The Path Viewer displays the Atlas, Infolinks, Topic Tree and other entry paths into the



FULL PRODUCT

DVD ONLY  
ROM

## WALKTHROUGH

# Getting started with Oxford Interactive Encyclopedia

Here we walk you through the Path Bar, and some of the relevant options you can choose



**1** This is the most common screen you will see in the Oxford Interactive Encyclopedia. Here an article, picture and the Find menu are all displayed. The Path Bar runs down the left-hand side of the screen. From here you can choose from many options to find the information you want. First, we'll begin with the Find path because it is already displayed.



**2** The Find menu is the most self-explanatory of the paths because it is based on the standard design found on other encyclopedias and help menus. Simply type in the name or subject you wish to find into the 'Starts With...' box, choose where you wish to look for it and press Return. The program will then return with 'hits', from where you can choose the relevant one for you.



**3** The Dictionary path brings up the Oxford Dictionary of the World, which acts as a dictionary and thesaurus. Simply type your word into the Current Word box at the bottom of the screen and press Return. The various options associated with that word will then be shown on the right-hand side of the screen. To make it easier to use this tool, we recommend that you maximise the dictionary pane by clicking the icon in the top right-hand corner.



**4** The Timeline option enables you to actually see what has happened. The page itself is partitioned into three subjects: Arts, Sciences and World History. Choose the one that interests you and search away. You can scroll the timelines back and forth through history, and up and down to see other events that don't fit on your screen. When you find an event that interests you, double-click it and it will show you all the information on it.



**5** The Media studio enables you to create your own movies from the media on the disk. Once you've found the clip that you want, click on 'add to script' to copy it over to the script on the right-hand pane. You can then string your movies together using the controls below the script pane. This is ideal if, say, you want to produce a presentation on a certain subject.



**6** There is plenty more to see in the Oxford Interactive Encyclopedia, but we haven't got room here to show you. Rest assured it's a user-friendly program, so handling will be easy for an information seeker of any age.

encyclopedia. This viewer also displays a list of an article's contents – sub-sections, multimedia and related articles – when you select Outline in the viewer menu. Select Go to Full Screen in any viewer menu or click on the full screen icon at the right-hand edge of the title bar to enlarge the window to fill the entire screen.

The Multimedia Viewer displays pictures, sounds, videos, animations, slideshows, tables and other media in the encyclopedia. You will also find the dictionary and thesaurus displayed in the Multimedia Viewer.

## The Path Bar

The Path Bar, which runs down the left-hand edge of the screen, displays the main avenues or paths into Oxford Interactive Encyclopedia's storehouse of information. This is a good place to start, whether you are researching a specific topic or just browsing. Click on a path button to display it in the path viewer at the bottom left-hand side of the screen.

Use Find to see alphabetical listings of the contents of the encyclopedia, or to find information about a specific topic. The powerful search engine will retrieve a list of articles, pictures, movies, sounds and tables that contain information related to your request.

Use the Atlas to explore the earth. Click on a location to turn the globe, or zoom in for a better view. Click on any place name to see an article about that place. The Timeline helps you learn about people and events in the arts, science or world history. Infolinks finds groups of articles related to a topic. When you enter a topic, the computer will search the encyclopedia for articles that are related to your subject and display them in an array of active windows.

Use the Topic Tree to see the articles in the encyclopedia arranged by topic and sub-topic. Browse through the lists to narrow your area of interest until you find an article you want to see. With Mediastudio you can create your own multimedia presentations on your favourite topic.

Use the Planatarium to view stars, nebulae and constellations in the night sky. Choose any day of the year and any point on the globe to look up and watch the stars track across the sky (Windows 95 only).

Use the Menu to access a variety of tools for exploring the Oxford Interactive Encyclopedia. In addition to the Guided Tour and Preferences, there are other features including the Star Quest Game (Windows 95 only), a Research Record listing up to 25 places you've been in the encyclopedia, and access to your favourite Word Processor.

## It's an indispensable tool

The Oxford Interactive Encyclopedia has a tool for every research style and need – and multimedia to facilitate understanding. We're sure you will find the Oxford Interactive Encyclopedia an indispensable tool that you will use again and again.

**Paul Ravening**



# Getting started with Softlocx version 3.0

Welcome to  
**programmer's  
heaven...** copy  
protection,  
network license  
management for  
your software,  
and trialware that  
gets registered



**W**hen you want to sell something, the deal's half done if you can get a potential purchaser to pick it up and look it over. The Internet offers unparalleled opportunities to put your software into the hands of interested parties. Putting these facts together is surely a recipe for riches if you're a hard-working programmer with a cracking idea up your sleeve.

It should be, but there's a devil in this particular Eden: only a few of the trial copies that end up in regular service will be paid for. The majority may be used daily for years, and you will never see a penny in return. That's dispiriting enough, but you also have to contend with people who hack into your software and steal your techniques. And what about the ones who buy a five-user license and then feed the 5,000 with it? Or even just a single license?

Effective answers to these problems include producing a demonstration version of your program that allows a full and fair trial, but limits how long or often it can be used without payment. Better still if the demo can morph into the full product once payment has been received and an unlock code issued. Add code encryption to make the program hack-resistant, devise a license manager that monitors other copies of the program running on the same network, build in a copy protection scheme, and you're sorted.

If you'd rather spend the time improving your product, Softlocx is for you. It will protect 32-bit Windows 9x/NT executables, is dead easy-to-use, royalty-free and ready for action on the SuperDisc. Follow this quick run-through and you can see how it works in only a few minutes.

Pick a program file to test the system on. Remember, it has to be 32-bit. Copy it to another

folder and run Softlocx. On the Select Programs tab click the top icon on the left – the one with a file and a '+' symbol. Select the copied file and it will appear in the list of selected programs.

Move on to the Desktop Settings tab. This is where you set restrictions for a single machine. Name the application 'My test app' – this identifies it within the Softlocx IDE. Type in a string you want to use as an encryption key. Tick the 'Hide screen on registration' checkbox. Leave the 'Credits/Uses' radio button checked and enter '3' into the box that asks how many times the software should be allowed to run.

On the E-Commerce settings tab, you can enter the URL of the Web page which will take payment. Just type in any valid URL for now. Try [www.pcplus.co.uk](http://www.pcplus.co.uk) if nothing else comes to mind.

Skip Network Settings this time round and move on to the Protect Programs tab. Peruse the options, but there is no need to change anything for this run-through. Just push the 'Protect Programs' button and wait a few moments for Softlocx to do its stuff.

Now use Explorer to view the folder where you placed the copy of the Exe file. You will see a backup of the original, and note that the Softlocx-processed version is smaller – by default, the protection process includes compression. This can be turned off if required but it's best left on.

When you run the protected program, you will see a splash screen put up by Softlocx which offers the opportunity to register. And when the evaluation period has been used up, nobody will be allowed to proceed to the program itself. Try generating an unlock code in Softlocx ('key' icon) and entering it into the protected program.

Softlocx isn't just about trialware. You can assert control over the distribution of any program you sell. If you're on a network, try going through the protection process again – you will first need to delete the processed .exe file and rename the \_bak version to what it was originally.

This time, enter some information into the Network Settings dialog. Make the number of licenses 2, and enter the full UNC to a folder where the license will be maintained. The quickest way to find a UNC is to navigate to the folder from Network Neighborhood and see what network path Explorer says it is. Enter this information into the 'Network UNC path' field, terminating it with a '\'. Protect the program and try to run three copies of it. Softlocx will only allow the two you specified. While no protection system is uncrackable, Softlocx certainly makes it far harder!

Protect the program and try to run three copies of it. Softlocx will only allow the two you specified. While no protection system is uncrackable, Softlocx certainly makes it far harder!

Ian Sharpe

## THOSE ICONS IN FULL

### The Softlocx toolbar

*Softlocx is easy to work with once you're familiar with its icons*



- |   |  |
|---|--|
| 1 Clear existing settings and start new project               | 7 Remove license from protected application on this PC |
| 2 Open previously saved configuration file                    | 8 Go to BitArts' Web site                              |
| 3 Save current settings to file                               | 9 Softlocx information screen                          |
| 4 Protection Wizard – alternative to dialog tabs              | 10 View help file                                      |
| 5 Customise your program's registration screen                | 11 Exit Softlocx                                       |
| 6 Create unlock code or network license for protected program |  |



## FULL PRODUCT



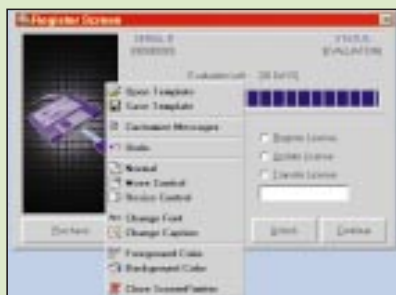
## WALKTHROUGH

## Protect your software in a few easy steps...

See how simple it is to ensure that only authorised people can use your programs



**1** Softlock's main window is a tabbed dialog. Work from left to right, or use the wizard – fourth icon along. Note what happens when you press the diamond-and-hand icon...



**2** Don't panic! You aren't asked to register Softlock – this dialog is for your own program. Right-click to customise, and note the ScreenPainter bar at the top of the screen.



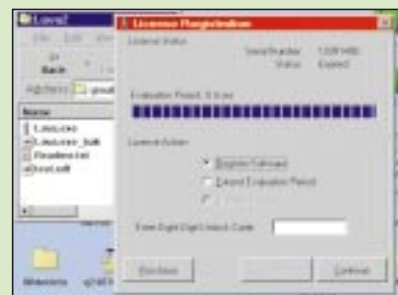
**3** On the Desktop tab you say how the target program may be used on a single computer, such as setting an expiry date or the allowed number of executions.



**4** If you take payments on-line, the e-commerce settings enable you to build the relevant URLs into a demo so that delighted users can be whisked off to the checkout.



**5** Softlock can check that a networked system isn't running more copies of your program than there are licenses. It can also foil attempts to break the limit by disconnecting PCs.



**6** This is an example of what happens when your program's evaluation period expires. Clicking the Purchase button takes the user to your Web site, credit card at the ready.

## Exclusive!

## Upgrade your Softlock 3.0 Express to

## V4 Developer Edition

Softlock Developer Edition version 4.0 includes all the functionality of Softlock Express version with the addition of the Softlock ActiveX (OCX) Control and the SDK CodeWizard and Softlock Encoder. This is the ideal tool for custom solutions or for those developers who want to have complete control over the protection of their software.

### Reasons to upgrade from Softlock 3.0 Express to version 4.0 Developer:

- Inject powerful protection into dlls, ocxs and scrns
- New Anti-Debug code prevents reverse engineering of protected files
- Compress/encrypt exes/dlls/ocxs and scrns
- PC Specific unlocks codes overcoming hard disk failures and so on
- Directly link dependent files such as ocxs and dlls into your protected program
- New ActiveX (OCX) Control

**Cost:**  
**£146.15** (inc VAT)

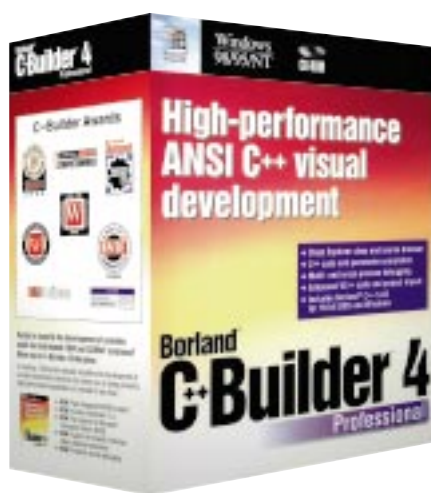
to upgrade from  
V3 Express to  
**V4 Developer**  
(Saving £87.68)

Normal RRP is  
**£233.83** (inc VAT)

To upgrade, phone 0800 581111 or +44 1189 581111



# Get up to speed with C++Builder 4.0 Pro



So you liked C++Builder 4 Standard Edition? This time round, **Dave Jewell** introduces you to its big brother, C++Builder Professional Edition which you can find on this month's *SuperDisc*

## TOP TIP

### Save some space

*There's a lot of content here...*

**B**orland used a number of ingenious techniques to maximise the speed and productivity of C++Builder. In particular, the development system uses a special incremental linker which greatly reduces the time required to create the EXE file. However, a side effect of the incremental linker is the enormous linker-state files which it produces. In the same way, a debug information file is created during normal operation.

You needn't worry about these files during ordinary programming, but you should be sure to delete them before moving on to a new project. Why? Because they're enormous! Try building the sample program which you can find in the `EXAMPLES\BDBTASKS\BDEMO` directory. This will leave you with four linker-state and debug information files, with file extensions of `.ILC`, `.ILF`, `.ILS` and `.TDS`. Total size of these files? Around 15MB! Yes, really!

If you compile all the sample projects that Borland supplies, you'll soon find that these extra files take up more disk space than C++Builder itself. So take a tip from us, and be sure to watch for and delete these mammoth files when you've finished with a particular project.

**L**ucky, or what? It's only a couple of months since we were treated to C++Builder Standard Edition, and now Borland has favoured us with a copy of the Professional Edition.

But wait – you've only just started getting comfortable with Standard Edition, so why should you go to the trouble of wiping it off your hard disk and installing the Pro Edition? Well, the Standard Edition is a great C++ development system but somewhat lacking in the database and Internet tools departments. It doesn't give you any data-access or Web-related components, and it's for this reason that we made use of freebie goodies such as the WinShoes Internet components in last issue's C++ Workshop.

Well, the really great news is that C++Builder 4.0 Professional Edition comes with a whole raft of Internet and data-access components, ready to just drop into your own applications. Because we've only recently looked at the Standard Edition, this introduction will concentrate on these new features.

## Installation

As before, we'd strongly suggest that you remove any existing C++Builder installation before loading version 4.0 Professional on to your hard disk. It is possible to have C++Builder version 3.0 and 4.0 'cohabit' on the same PC, installing them into different directories but, if you do so, you must follow the golden rule of installing the most recent development system last. The 4.0 Professional Edition requires around 140MB disk space, and you need to bear in mind that this is just for

C++Builder itself. In addition, the installer program will want to install the BDE (Borland Database Engine) as well as InterBase; all in all, you'll need at least 175MB of disk space and Borland recommends 300MB for a full installation.

Before leaving installation issues, remember that the BDE and InterBase are shared components. In other words, they can be potentially shared with other Borland development systems such as Delphi 4, Delphi 5, C++Builder 5.0 and so on. What this means is that you're free to put C++Builder 4.0 itself in any directory you choose, but you'd be wise to accept the suggested directory assignments for the shared components. That way, these shared components will be easier to locate and upgrade when installing multiple development tools on to your PC.

## So what's new?

If you've been following C++ Workshop, you'll know that we've spent a while working with the WinShoes Internet components, all of which are free and come with full source code. On the Internet page of the component palette in C++Builder Professional, you'll see no fewer than 21 new components, all of which relate to Internet access. So now we're spoilt for choice – should we use the ones provided with C++Builder, or stick with WinShoes? To be honest, it really depends on how much you like to dabble with the internals; if you feel more comfortable with the source code, then stick with WinShoes. On the other hand, if you want an 'all-in-one' solution which doesn't require any

## FULL PRODUCT



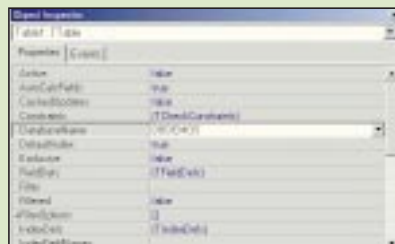
## GETTING STARTED

# Now you can easily work with databases!

Six steps to recordset rapture...



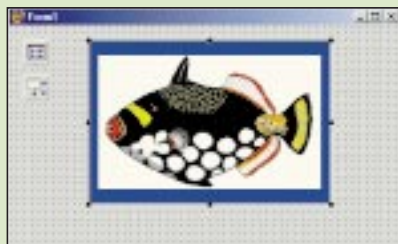
**1** First step in working with an existing database is to drop a TTable component, a TDataSource component and a TDBImage component on to an empty form in a new application. Here, we've also set the Color property of the TDBImage component to something a little more colourful...



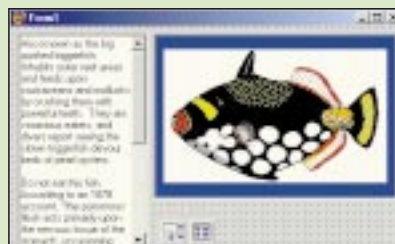
**2** The next job is to set the DatabaseName property of TTable component so as to refer to the database we're interested in; in this case, it's called DBDEMOS, which is automatically set up when you install C++Builder Professional 4.0. You can then set the component's TableName property to BIOLIFE.DB.



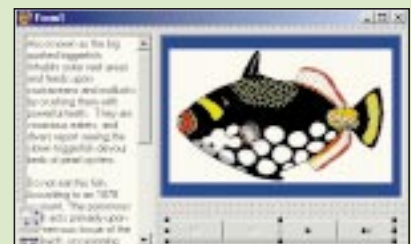
**3** Set the Active property of the TTable component to True. At this point, we've got a live connection to the database. While you're at it, select the TDataSource component and set its DataSet component to 'point' at the TTable control. The TDataSource is responsible for 'dishing up the data' to any data controls on the form.



**4** Now for the exciting bit! Select the TDBImage component and set its DataSource property to reference the TDataSource component. Finally, we need to tell C++Builder which field we want to display. Choose 'Graphic' in the component's DataField property. Got it right? You should now see this fishy-looking bitmap...



**5** In exactly the same way, you can add more data controls to your form, showing other fields in the record. Here, we've added a TDBRichEdit control, which is displaying the content of the 'Notes' field. Just drop it on the form, set up its DataSource property, and choose Notes in the DataField property. Easy peasy...



**6** Last, to make it easy for the user to navigate through the dataset, add a TDBNavigator component and set its DataSource property as before. Notice that the First and Previous buttons automatically dim out to indicate that we're at the beginning of the dataset. You can use the VisibleButtons property to determine which buttons are actually visible to the user.

third party components, then use what comes with C++Builder Pro.

Strictly speaking, those Internet controls are third party components. They weren't actually developed by Borland, but by NetMasters. If you want to check out the NetMasters Web site and download any updates, you can find it at [www.netmastersllc.com](http://www.netmastersllc.com). However, unlike the WinShoes people, these guys do charge real money for source code!

In addition to the Internet controls, C++Builder 4.0 Professional also includes a rich set of components for database work. You can find them on the Data Access and Data Controls page of the component palette. So what's the difference between the two? You can think of the data access

components as a 'channel' that links your C++Builder program to a particular database. The data controls, on the other hand, are responsible for displaying the actual data, whether it's simple ASCII text, formatted text, an image bitmap or whatever.

To get the best from these components, you'll need to have a reasonable understanding of database concepts such as tables, recordsets and so forth. To make things a little easier a number of 'demo' databases are automatically loaded on to your PC when you install C++Builder 4.0 Professional. To see how easy it is to work with data in this way, try working your way through the six part tutorial that accompanies this introduction. If you make a mistake, don't panic because the full

source code is included on the cover disk. (Note: You won't be able to run the included EXE file until you've installed C++Builder.)

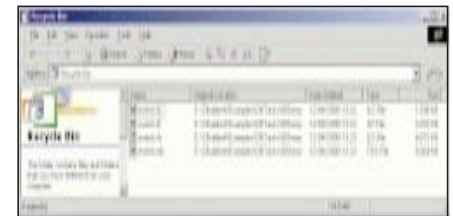
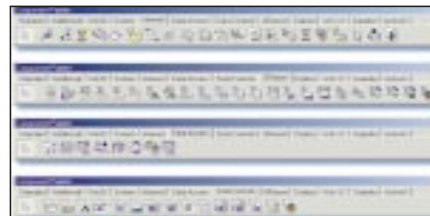
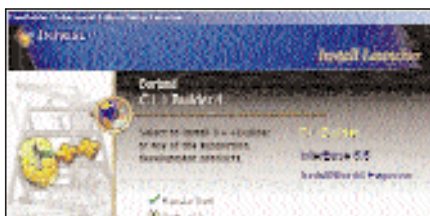
Though space doesn't permit a detailed discussion here, you'll also see that C++Builder 4.0 includes a powerful and comprehensive set of reporting tools called QuickReport. You can use these tools to lay out a report just as easily as if you were designing a form. C++Builder includes the Standard edition of QuickReport, but you can get more details on QuickReport Professional from the official QuickReport Web site at [www.qusoft.com](http://www.qusoft.com). Have fun, and happy programming with C++Builder 4.0 Professional Edition!

**Dave Jewell**

Be warned that the Professional version of C++Builder 4 requires up to 300MB of hard disk space, depending on the specific options that you choose. Be sure to remove the Standard edition first.

Here's what you get with C++Builder 4.0 Professional – at least 67 more reusable controls than was the case with the Standard Edition, and all free on this month's SuperDisc!

C++Builder can use up your free disk space like it's going out of fashion. Take care to put those redundant incremental linker and debug information files where they belong – in the Recycle Bin!







# Borland JBuilder 3.5 Professional

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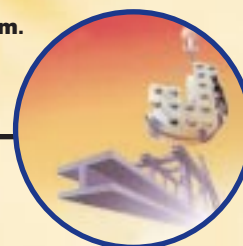
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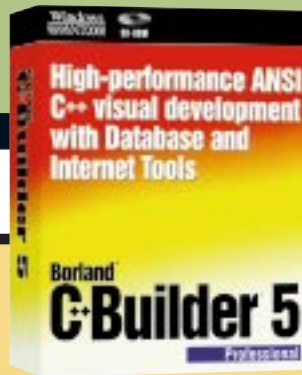
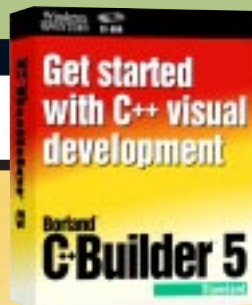
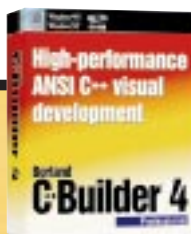
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For more information about JBuilder, see the Borland/Inprise Web site at [www.borland.com](http://www.borland.com).



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PCP166



# Strata 3D 3.0

Delve into the 3D world, with Strata 3D 3.0. Paul Ravening shows you how

**W**hether this is your first voyage into 3D or you are a seasoned operator, Strata 3D 3.0 delivers everything you can imagine to any media you choose. With Strata 3D 3.0, you hold in your hands the power to be the Jacques Cousteau of modern media. Innovative Web connection technology submerged in the software keeps you on course, with an instant lifeline to 3D.com libraries, information, tutorials and resources

Strata Studio is a 3D modelling and animation program that enables you to create really stunning 3D images, models and amazing animations. Strata Vision 3D was the one that started it all – with its powerful modelling tools, it has been used to create imagery from multimedia 3D interactive games to TV broadcasting. Both Strata Studio Pro and Strata Vision 3D handle the most complex subject with ease.

Strata tools have been used for major feature films such as *Wild Wild West*, *Deep Blue Sea*, *The Fifth Element* and *Batman Forever*, as well as for hit computer games such as *MYST*, television shows like the *MTV Movie Awards*, *The David Letterman Show* and *Xena*, and the Web sites of Warner Brothers, Blockbuster Video and NBC.

## New generation of software

Strata 3D and Strata 3D Pro are part of a new generation of software developed in conjunction with 3D.com. The software is Web-enabled, allowing users to interact directly through the software application to the Internet. Strata 3D has interface elements that users can click to open its Web browsers and launch directly into [www.3d.com](http://www.3d.com). The interactive links in the software take users to on-line resources, information and related products.

3D.com is accessed through the Strata 3D application. The navigation bar (nav bar) appears to the right of the Button bar at the top right-hand side of your screen whenever you are working in Strata 3D.

## The interface

The Feedback area helps you find and identify tools and buttons. As you move the cursor across the tools and buttons in Strata 3D, the name of the tool or button appears in the Feedback area.

If you move the cursor over the Modelling window, the feedback area will display the cursor's position, using the x, y and z co-ordinates. This helps you model with precision.

The Button bar is located right below the menu bar. Most of the buttons are shortcuts to tools and functions. The buttons are identified in the feedback area as your cursor passes over each button.

access to all of the resources of the 3D.com Web site – textures, shapes, tutorials, articles, games and so on. The Tool palette contains view management and object manipulation tools, modelling drawing and construction tools, and a rendering tool.

The Extension Tool palette has two tabs: the Commands tab contains shortcuts for several modelling menu functions; the Extensions tab contains Path Extrude, and Convert to Path. This palette will change, depending on which extensions are loaded on your machine.

The Resource palette manages your shapes, textures, special effects, gels and backgrounds. The

Environment Palette enables you to create unique environments for your model. You can control the ambient light, set a ground plane, add a background or even make the wind blow.

The Object Properties palette lets you edit an object's size, complexity, location, texture and so on. The options available depend on the type

of object you have selected.

Tools are selected by clicking, and they stay selected until you choose another tool. To save time and frustration while learning, make sure you check your tool selection before you try to do anything in the modelling window.

You can toggle back and forth between the last two tools you have used by hitting the space bar. The Object move, rotate and scale tools have hotkeys: the numbers 1, 2, and 3, respectively.

Your cursor will change in appearance as you select different tools, helping you keep track of which tool is selected. Enabling Caps Lock on your keyboard will change the cursor to a cross-hair cursor with most of the tools. This helps when you need greater precision.

There's plenty of support of Strata 3D on the Web, with plenty of forums dedicated to it, so new users won't feel lost for long.

**Paul Ravening**

## Strata Studio is a 3D modelling and animation program where you can create really stunning 3D images, models and amazing animations

The section on the left contains file handling shortcuts: New, Open, Save, Cut, Copy, Paste, and Undo/Redo. The second section of the button bar contains shortcuts for frequently-used modelling functions such as Reshape, End Reshape, Convert, Align, Re-Center, Group and Ungroup.

Strata 3D has several palettes: the Information palette, the main Tool palette, the Extensions palette, Resource palette, Environment palette and Object Properties palette. These palettes contain information, tools and resources. They can be displayed in condensed or full format.

The Information palette contains the Statistics (Stats) tab, and the 3D.com tab. The Stats tab lets you gather information about your model and view how many objects, light sources, spline patches, and polygons are in your model, as well as a list of shapes. This information can be saved as a text file. The 3D.com tab gives you



## FULL PRODUCT



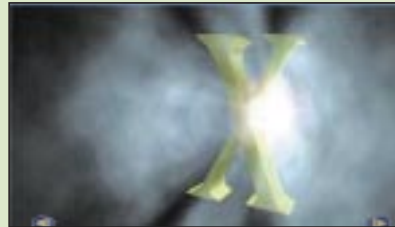
## WALKTHROUGH

# Getting started with Strata 3D

*Design your own floating X with added mist. Spooky eh?*



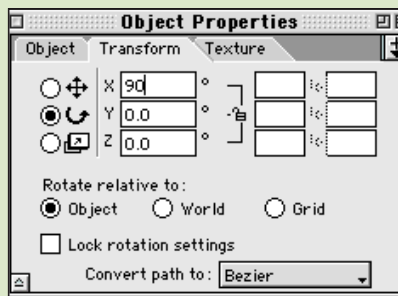
**1** Strata 3D has the ability to apply volumetric shaders to objects, lights and words. Although they enhance the realism of a scene, volumetric shaders, if not used wisely, can greatly increase your rendering time. For this tutorial, we will focus on the properties of Mist.



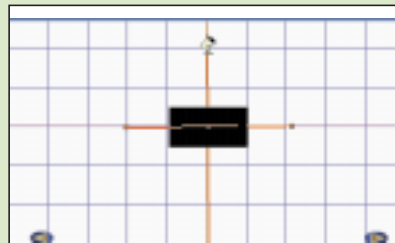
**2** Create a new document in Strata 3D. Go to the edit menu and make sure Snap to Grid is on. Select the Text tool from the Tool palette. In isometric view, click and drag the size of the text to four inches. Release the mouse button when the desired size is achieved.



**3** The text dialog will now appear. In the Enter Text field, type in the letter X. Make sure it is in uppercase. Use the pop up button to select the style of text you want. Leave the bevel at default – it should be at 'No Bevel'. Set the Extrude Slider bar to one inch and click OK. You should now see your X, lying flat on the 'y grid'. Open up the Object Properties palette.



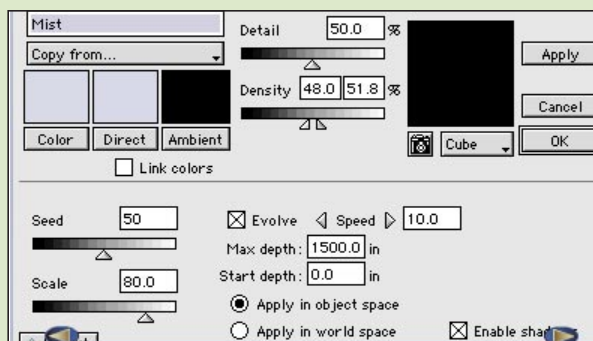
**4** Now you need to rotate the object up 90 degrees. Make sure the X is selected. On the Transform tab of the Properties palette, select the Rotate radio button and the Rotate Relative to Object radio button. Insert 90 in the x field and click ok. This will rotate your X. Select the Position radio button (the one that looks like four arrows) and set the values to x=0, y=2 and z=0. Press the enter key to set the last value. Finally check the Lock settings box, to make sure your hard work isn't ruined later on.



**5** Switch to the top view. Place a spotlight about two inches behind the X. Select the Object Move tool and drag the spotlights targeting system on to the X. The object will be highlighted in red when properly targeted. Go to the Object Properties>Object tab. Set the light intensity slider to 100 per cent. Click on the pop up menu that reads 'Light Source Radius' and select 'Total falloff distance'. Set it to ten inches. Be sure that shadows are checked and set the cone angle to 90 degrees.



**6** Now that the light is set up, you'll need to create and apply a shader to the light source. In this tutorial we will use Mist. In the Resource pallet > Texture tab, click on the new pop up button and select Mist. In the Mist settings dialogue, set the density to 50 per cent and change the colour to light blue. Change the ambient to black and enable shadows.



**7** Now you need to apply the Mist shader to the spotlight. Select the spotlight. From the Object Properties palette, pull down the FX option and select the Mist Texture. In the Environmental palette, click on the Global light and click the delete key on the palette. Be warned, clicking the delete key will delete any highlighted object at the time. Change the ambient colour to black and use the view rotate tool to rotate the modelling view to set the angle and view of the camera. When you have the view you desire, go to the Plus menu at the top right of the modelling window and select 'Make Camera from View'.



**8** Set the camera lens setting to 35mm by moving the lens slider to the right until the feedback area reads 35mm. You may also want to use the zoom function to bring your object closer to the camera. To render your final image, select the rendering tool and click render.



WEB GRAPHICS

# Xara 3D 1.0

Want some  
**flashy logos** on  
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Xara 3D 1.0 enables  
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much more

**X**ara 3D 1.0 is designed to create the highest quality 3D titles and logos for use on Web pages or any on-screen presentations you may wish to produce. All images are fully anti-aliased for a smooth, professional-quality finish.

Xara 3D 1.0 is also capable of creating simple high-quality GIFs and AVI movies in seconds, letting you bring your logos to life. Follow this simple step-by-step tutorial and you'll soon have your own 3D logo in full, blazing colour.

**Paul Ravening**



Changing the bevels of your logos helps bring them to life.

## WALKTHROUGH

### Six steps to animated bliss

*It's easy to produce stunning 3D logos – just follow our simple walkthrough*



**1** To position or rotate a 3D test object in the window, click and drag your mouse within the window. This operation has been designed to be as intuitive as possible. Alternatively you can use the vertical and horizontal scroll bars to rotate the object vertically and horizontally. To control the size of the image, resize the window, as you would any window. Everything in Xara is WYSIWYG – so the size you see on the page, is the size you get.



**2** The anti-aliasing process can take a minute or two to complete when you are interacting with your image. When you are editing, the program downgrades the image to a lower quality, non anti-aliased image. As soon as you leave it alone for a few seconds, the program will revert back to a high-quality image. Animation is controlled from the Animation tool button, where you can choose how often it revolves.



**3** In order to be any use on your Web page, animated GIF files need to be small so they have an acceptable download time. The fewer revolutions your GIF has, the smaller it will be. If you don't want your GIF to face its back to your viewer, you can choose Font face only, which makes the GIF only spin 180 degrees.



**4** Xara 3D 1.0 can export the image in three different file formats (BMP, GIF or JPEG images) and two animated file types (AVI movies and animated GIFs). Select Export on the file menu and then select the appropriate format on the drop down menu and save as Type. Enter the name and click OK. This displays the export options dialogue box which controls the quality of the image.



**5** To view the lights used in Xara 3D 1.0, press the light bulb button. This shows the three lights, represented by the coloured arrows. You can alter the colour of any light by double-clicking the arrow. To reposition a light, simply click and drag it to its new position. To alter the text colour, press the E button which enables you to change the 3D depth, matt or gloss colour and many other options.



**6** And there you have it, your finished logo. Your Web pages will never be the same again...

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# Xara 3.0

Xara 3D 3.0 offers very high performance, high-quality results, and is the simplest, quickest 3D program you will ever use

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- Increased character limit
- Outline text
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To take advantage of this special offer, you need to access the special offer Web site at

**[www.club.xara.com/x3d/upgradefuture.asp](http://www.club.xara.com/x3d/upgradefuture.asp)**

This special upgrade offer is only available via the Web and payments are only accepted using credit cards





# loads of **LINUX**

Bring your system up-to-date, serve a Web site or two, and get talking to Netware with the aid of this month's *SuperDisc*!



The Apache Web server is the most popular on the Internet.

## APACHE WEB SERVER (CD and DVD)

Apache ([www.apache.org](http://www.apache.org)) is by far the most popular Web server on the Internet. In a survey conducted by Netcraft ([www.netcraft.com/survey](http://www.netcraft.com/survey)), 60 per cent of all Web sites tested were running the Apache server with Microsoft's IIS trailing behind with 20 per cent of the market. It's easy to see why – Apache is fast, fundamentally free and highly configurable.

We've put Apache 1.3.1.2 on the *SuperDisc*, along with a collection of contributing modules. Installation can be quite a complex procedure, so be sure to read the README files before you begin. You will find a mirror of the Apache installation guide on our Web site at [www.pcplus.co.uk/discs](http://www.pcplus.co.uk/discs).

Once you have Apache up-and-running, you will want to do something with it! *PC Plus* has got just the thing, in the form of two sets of Web scripts.

## WEB SCRIPTS

The days of sitting in front of emacs and writing out endless reams of code for flat HTML sites are gone. With the free Apache and MySQL available for the Linux platform, almost every site is now dynamic and data-driven – for good reason. Database-driven sites are far easier to maintain in the long run than flat HTML sites consisting of potentially thousands of files sprawled over a server's hard drive.

Two large sites make their back-end scripts freely available for public use and development.

## SLASHDOT (CD and DVD)

We've often mentioned them here in *PC Plus*. Slashdot is extremely popular with the unixbeard community – its site is a veritable treasure trove of industry news, event tracking and soapbox provision. Each story posted to Slashdot enables you to post a reply to the author, voicing your opinion – there is an almost fanatical 'first post' following of people itching to have their say on whatever the good folks at slashy put up there.

The back-end slash dot code, slash, is available as a free download – and when you compare the slashdot (<http://slashdot.org>) and slashcode (<http://slashcode.com/>) Web sites, it soon becomes apparent just how ultimately customisable the code is – the two sites barely look alike. Full installation instructions are included in the tarball. These take in everything from server and database design and required Apache modules before getting down to the actual installation instructions. There is a full FAQ and installation guide in slightly friendlier format at <http://slashcode.com/faq.shtml>. Slashcode is increasingly making use of Source Forge.

## SOURCE FORGE (CD and DVD)

Source Forge (<http://sourceforge.net>) is an increasingly popular VA Systems / Linux.Com

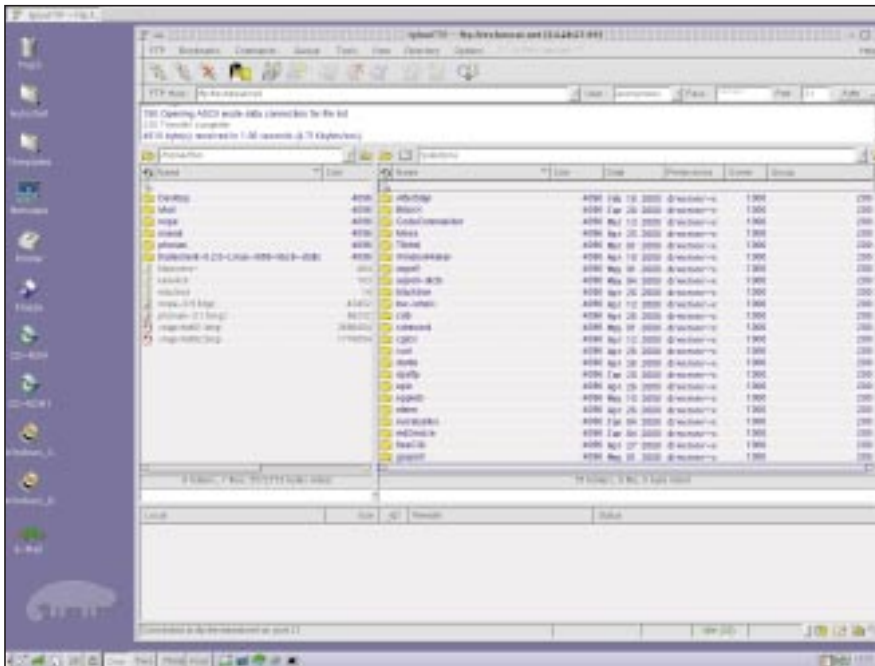
One set of code, two very different designs – ultimate flexibility.



## FULL PRODUCTS



## LINUX SOFTWARE



Freshmeat.net as seen through IglooFTP – that's a whole lot of software.

affiliate site which hosts numerous software development projects. The site uses user authentication to provide access to varying levels of information. Ultimately, Source Forge aims to take the strain of change management off the shoulders of the software developers, leaving them to get on with the more useful business of coding.

Source Forge enables a mass of information to be hosted on its servers – from complete change logging systems to discussion forums, to support and documentation, to downloads – and the project that runs the site and keeps it all updated is hosted on Source Forge itself, so you can contribute to the development of these scripts while visiting!

Source Forge requires Apache with SSL and PHP support, and MySQL running the back end. Full documentation in an easy to read format is included in the tarball. You can also get support on-line at [http://sourceforge.net/project/?group\\_id=1](http://sourceforge.net/project/?group_id=1).

### KERNEL 2.2.15 (CD and DVD)

The kernel is the very heart of your system and, at the time of writing, we are moving in to the development of 2.4. Check [www.kernel.org](http://www.kernel.org) to find the latest version. Alan Cox at [www.linux.org.uk](http://www.linux.org.uk) sums up the developments for the intel kernel, here's a brief run down of the new features:

- Cyrix DMA emulation bug workarounds
- APM updates and fixes
- The parallel port probe now tries harder to get data from the device
- Some minor bugs in the FAT file system handling have been fixed

- Fixed a window handling bug on the 3c529 driver. Fix a lock setup bug
- Fixed denial of service problem
- Fixed crash in the joystick driver

Installing a new kernel isn't something you should take lightly – there are numerous guides out on the internet that will hold your hand. Linux.Com have a very good introduction to the role of the kernel and recompiling it at [www.linux.com/newsitem.phptml?sid=60&aid=8841](http://www.linux.com/newsitem.phptml?sid=60&aid=8841).

### FTPGNOME.ORG (DVD only)

We have a partial mirror of gnome.org on the DVD for your enjoyment – after DVD replication it became apparent that there were some problems with the download that our scripts didn't detect. We have now fixed the scripts and hope to have better luck next time! On the DVD you will find all of the gnome utilities (version 1.0.50-1), the gnome core libraries, and glade – the exciting gnome Integrated Development Environment tool to name but a few. Unfortunately, due to our download difficulties, you will find a large number of empty directories in the tree – we hope to re-run ftp.gnome.org next month, correctly.

### FTP.FRESHMEAT.NET (DVD only)

There were no problems with the huge RPM library provided by Freshmeat.Net! This mirror truly is an invaluable software resource. It includes the RPMs for the blackbox, Afterstep, and WindowMaker window managers, along with a number of useful tools such as sudo. For licensing reasons, you won't find a copy of every piece of software mentioned on freshmeat, but there is a fair cross section of development and release software

### XFREE 86 4.0 (DVD only)

The latest release of the X server for linux has received a lukewarm reception – so be careful before you throw it on to your box. This is from the Xfree86 FAQ: "The road to XFree86 4 began in mid 1997, with serious work starting in early 1998. The first pre-4.0 snapshot was released in mid 1999, and 4.0 was released in early 2000. A lot has been completed in that time, and even more has been started since the '4.0' design was drafted. The result is that this release contains a lot of new features, some new drivers, and some significant performance improvements. This release contains components in various stages of development, ranging from stable and well tested to new and not-so-well tested. On the other side, there are drivers from the 3.3.x series that have not yet been ported to XFree86 4. Most of these are for old hardware. To find more information about which hardware is supported, see the Driver Status document at [www.xfree86.org/4.0/Status.html](http://www.xfree86.org/4.0/Status.html)."

### IPX NETWORKING (DVD only)

You will find all of the utilities you need to get your machine talking happily with the IPX protocol, commonly used on Netware networks. In the IPX folder, you will find:

- ipx.tgz – low-level ipx utilities from Caldera, also in ncps-0.x.tgz
- ipxripd.x.x.tgz. An IPX RIP/SAP daemon that works on 1.2.x and 1.3.x kernels. This includes the latest 1.3.x kernels with the full internal IPX network enabled
- mars\_nwe-x.x.tgz. Martin Stover's NetWare emulator. It has more features than lwared, such as no need for a kernel patch, a disk-based bindery and rudimentary printing support. It works fine with the full internal IPX network, new in Linux 1.3.60
- mars\_dosutils-x.x.tgz. Some little DOS utilities done by Martin. With one of these, you can change a user's password on mars\_nwe.marsmail-x.x.tgz. Some little programs and config files for using PMAIL with mars\_nwe
- lwared-x.x.tgz. LinWare, NetWare emulator by Ales Dryak
- ncps-2.0.x.tgz. NetWare client filesystem for Linux. This version is for Kernels 2.0.x and older. It contains the user utilities required for ncps of latest 1.3.x and 2.0.x kernels, as well as a kernel module for 1.2.13

Rob Fenwick

### CONTACT US!

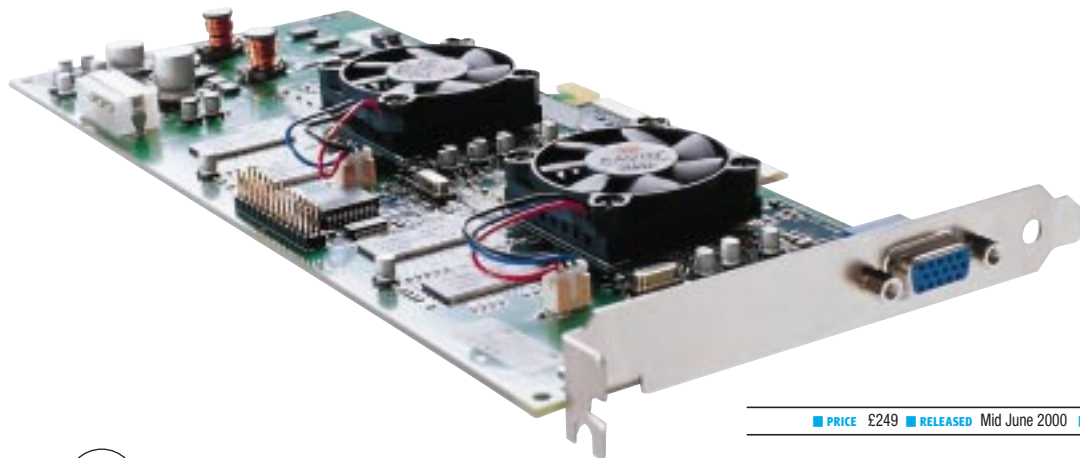
## WHERE NOW?

Linux software is now sharing a DVD side with Bill Gates' army, so we're having to be selective about what we run. What you like to see on the SuperDiscs? Please get in touch with me ([rob.fenwick@futurenet.co.uk](mailto:rob.fenwick@futurenet.co.uk)) and let me know!



# 3dfx Voodoo5 5500

*Can 3dfx wrest 3D accelerator dominance back from nVidia with its twin-chip approach?*



**Minimum requirements** Pentium 233 or better, 32MB RAM (64MB recommended), PCI or AGP slot (AGP 2x or 4x recommended)

**Tested on** Pentium III 800, 128MB, AGP 4x, Windows 98SE

**Extra information** Voodoo5 5000 also due to launch

The large Voodoo5 5500 card uses twin processors to increase frame rates and implements full-screen anti-aliasing, which reduces jagged edges and so-called pixel popping.

■ PRICE £249 ■ RELEASED Mid June 2000 ■ SUPPLIER 3dfx ■ WWW <http://europe.3dfx.com>

**3**dfx, purveyors of all things Voodoo, is about to introduce its latest range of 3D accelerator cards, the Voodoo5. Continuing where the Voodoo3 left off and with potentially nearly twice the performance, the company has gone the way of several top graphics producers, in releasing a card with twin processors on board.

Nowhere in the PC hardware market are battles as keenly fought as with graphics adapters. The company owning the 3D graphics accelerator with the highest performance can claim nearly all the spoils. It will obviously get card sales from keen games players, but it will also have a way into the increasingly lucrative integration market, where graphics chips are built onto system boards or even incorporated into multi-function chipsets.

The pre-release Voodoo 5 5500 board we were sent is around the same physical length as a typical system board, so you should check there's nothing that could get in the way behind the AGP slot. Because of the twin graphics chips – and their accompanying fans – the card needs a separate power supply and a supplied cable splitter has to be connected to any passing power lead, such as one feeding a drive.

The two chips, which are new VSA-100 accelerators, are linked

together on the card to work in scan-line-interleave (SLI) mode. This is the same technique that used to be possible with two add-on Voodoo cards. Dedicated gamers circa 1996 would buy two of these cards and connect them together internally with a small ribbon cable.

The two cards then worked on consecutive frames in a game, one

the extra bandwidth DDR provides, because of the high bandwidth already available from the twin-processor approach. The Voodoo 5 series now supports 32-bit colour depth – not a minute too soon.

3dfx's VSA-100 chip is a 128-bit processor which includes a lot of the Windows GUI encoded in hardware for increased speed. 3dfx

extra burden on the graphics processors, but 3dfx now claims to be able to include FSAA without too great a performance hit.

One of the ways the card keeps the performance up is through the implementation of a T-Buffer, a trade-marked buffer enabling integration of graphic data in many different ways. The buffer makes possible motion-blur effects and depth of field hinting, as well as FSAA – on existing games as well as new ones.

Voodoo5 doesn't support hardware Transform and Lighting (T&L) effects. 3dfx may say there are few games providing T&L yet, but they won't be long coming and these cards only support the effects in software.

Since card and driver were both pre-release, and may still be subject to modifications, we'll wait for a full review of the card before releasing any test results. This doesn't mean we didn't test it, though. It ran smoothly, without any of the hiccups often found in early releases of software and hardware and returned figures which looked promising, though at this stage not up to the market leader.

The Voodoo5 5500 won't be a cheap adapter, but you have to pay for top-flight 3D acceleration. Whether it will prove to be worth the money is something a full review will have to decide.

## In test it ran smoothly, without any of the hiccups often found in early releases of software and hardware

taking all the odds frames and the other all the even ones. Between the two cards you got frame rates much higher than from a single card, though short of being double the speed. 3dfx's Voodoo 5 uses the same technique automatically between the two processors on the card.

Voodoo5 5500 cards come with 32MB of memory for each processor, but the cheaper 5000 cards will come with a total of 32MB, divided between the two. Memory is Single Data Rate (SDR) rather than the Double Data Rate (DDR) being used by nVidia and others. 3dfx claims it doesn't need

claims it can fill up to 366 million pixels and draw up to 11 million triangles per second.

The two main factors the VSA-100 brings to the 3D graphics equation are Full-Scene Anti-Aliasing (FSAA) and a T-buffer. Anti-aliasing is a technique for reducing the appearance of jagged diagonal lines and curves, by introducing semi-coloured pixels at their edges. Although the effect slightly blurs line edges (see any opening Windows splash screen) the effect at the detail level of most games is to smooth lines out. Anti-aliasing requires multiple rendering passes, which puts on





# Terabyte optical discs

*CD-like discs that can store an incredible 50GB of data and credit cards holding whole movies are only months away*

**T**he speakers at DVD Europe 2000 moaned about the difficulties they have squeezing five European languages on to their region 2 movies while still finding room for the trailers, music videos, alternate endings and directors comments we've come to expect from the US discs. A few steps away in a small room, the prototype of a product that will end their woes silently spun in a bodged together drive.

The claims Constellation 3D ([www.c-3d.com](http://www.c-3d.com)) makes for the new media, known as Fluorescent Multi-layer Discs, or FMD-ROM, are nothing short of phenomenal. The first generation, ready for mass production within the year, will store the equivalent of half a dozen DVDs. Best yet, they'll be backwardly compatible, reading existing DVDs and CDs. The ClearCards – or FMC-ROM – will hold as much as a current DVD in the size of a credit card, and will ship in 18 months.

If carrying a movie around in your wallet sounds good, wait until Constellation 3D works out the bugs in its re-writing technology. Drop a piece of plastic the size of a postage stamp into your digital camera and store, retrieve, erase and rewrite gigabytes of images. With no semi-conductors or circuitry, it should be far cheaper than the current flash-ROM.

## Three dimensional data

At first glance, FMD-ROMs don't look like they store any data at all. We're all familiar with the tin-foil looks of CD and DVDs. The new discs, however, are completely transparent. And that is their secret.

Data is stored on traditional CDs and DVDs by burning holes (known as pits) in the reflective layer. The laser in the reader is either bounced back or absorbed, registering the slew of zeros and

ones that make up the audio, video or binary data.

FMDs contain no reflective material. Instead the cutter burns pits in a clear substrate, which are then filled with a fluorescent material. The reader uses a laser, just as with a traditional disc, but as the light hits one of the filled pits it fluoresces. The reader picks up the glow, registering it as a zero or one.

The huge capacity comes from creating dozens of layers on a single disc. Each layer contains as much data as a traditional DVD. Since the laser focuses on a particular layer to read it, the number of layers is basically only limited by how finely a reader can focus its light. Current drives use red lasers, with a wavelength

around 650 nanometers. These will be able to focus on somewhere around 50 individual layers. But drive manufacturers are already working on blue laser technology with a wavelength in the 400nm range, which will see the number of layers in FMDs rise to 100 or more. Terabyte discs are only a few years away.

## Glowing potential

The multi-layer fluorescent structure has numerous advantages. By splitting the laser beam, multiple layers can be read at once, making read speeds around a gigabyte a second possible.

Normal DVDs can contain two layers. But that's about the limit. When the laser light bounces off

the lower layer, some of it hits the layer above, creating 'ghost' data that the reader must filter out. The size and even shape of the pits in the reflective material are crucial to how well the disc can be read – ragged edges play havoc, create interference and lose data.

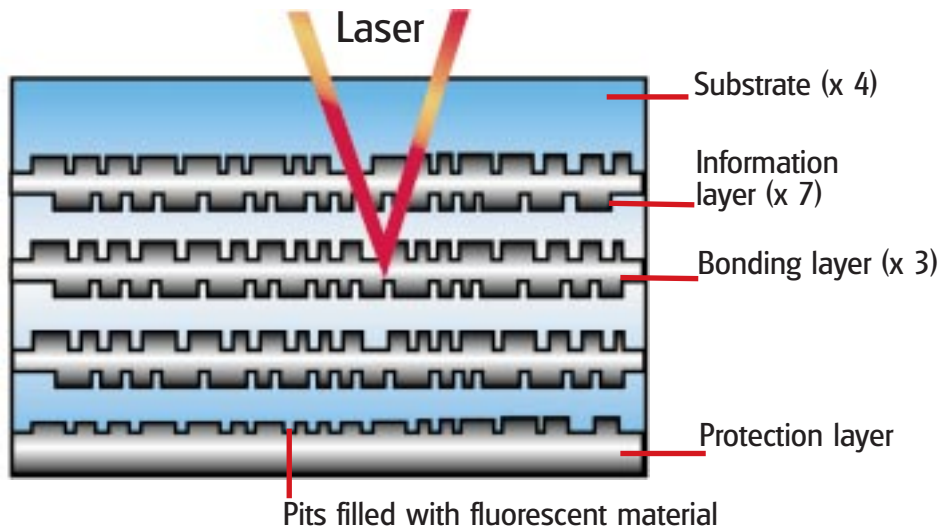
Fluorescent light is fundamentally different. Unlike reflected light, it's not the same wavelength as the laser light, making it easy for the reader to distinguish between genuine data and light reflected from the surfaces between layers. And because the light leaving the disc is not of the exact wavelength that excites the fluorescent dots, it passes straight through them with next to no absorption.

It's also incoherent. This doesn't





## MULTILAYER FLUORESCENT DISK (for example, 7 layer)



Each physical layer contains two layers of data, separated by transparent bonding material.

mean it's slurring and unintelligible – in optics incoherent light, unlike lasers light, is not of a single wavelength. Constellation 3D claims incoherent light is less affected by scratches and flaws in the medium itself. Sure, when CDs first came out we were told they were immune to scratching, but there is some evidence to back up this time. The prototype we saw was made from glass, not plastic. The surface was alarmingly rippled, with some small bubbles where the seven layers were bonded. Yet each layer played crystal-clear audio.

The first uses for fluorescent multi-layer technology will be the familiar CD-sized discs. Constellation 3D's researchers in Russia and Israel are close to prototyping writable and rewritable media. All it requires is a laser to turn on and off the

fluorescent properties in the data layer. They should have the technology worked out within a year.

Next will come the credit card-sized discs. The first will probably be essentially rectangular mini-discs that play in MFD machines, but hot on their heels will be the ClearCards. Containing a square block of multi-layer fluorescent material, these will require a special reader that moves them back and forth, reading 'pages' of layers at a time.

### Do we need the space?

We had to wonder what use all this space would be. We've already mentioned the possibilities of small rewritable cards in digital cameras. The rest of the DVD Europe conference provided some more answers.

First comes the problems authoring houses are already having with European (region 2) DVDs. In order to fit all the different language versions of their movies on to a disc, they are already sacrificing content.

**The huge capacity comes from creating dozens of layers on a single disc. Each layer contains as much data as a traditional DVD**

Consumers hate to think they're getting less here than in States, and so tinker with their DVD players and order region 1 discs over the Web, defeating the entire purpose of regional encoding.

But the applications go beyond consumer films. A BBC representative at the conference was extremely interested in MFDs for archiving material. They'd probably use glass instead of plastic discs, creating media that would last hundreds of years.

That's one of the things about technology. No sooner has media expanded then people have found a way of filling it to the brim. Look forward to future editions of *PC Plus*, with 50 gigabytes of software on the cover!

**Matt Kynaston**

There's a way to go before drives capable of reading the new media are on sale, but Constellation are working with all leading suppliers. In the meantime, A home-made looking bit of kit does the job.

